DECEMBER 29, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

West Europe Bids To Shift Trade Pattern in 1953

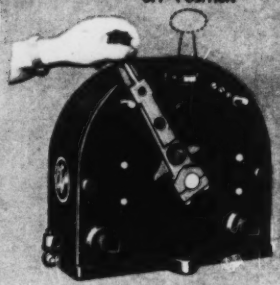
—p. 54

✓ STEEL WAREHOUSEMEN GET SET
They Expect Buyers' Market, p. 43

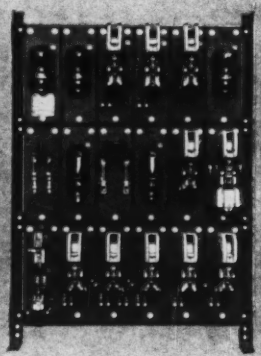
✓ PLANNED ELECTRIC POWER PAYS
System Should Be Versatile, p. 72

HEAVY LOADS

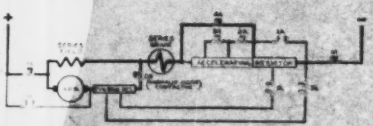
SPOTTED QUICKLY, SAFELY



Speed-control Master Switches have short throw —narrow width—and are convenient for the operator to use.



The Wright Dynamic Lowering Circuit Controller (with protection) for crane-hoists.



First point lowering connections put all the current from the line through the brake for fast release.

Here's Where EC&M CONTROL Gives Unexcelled Results

The EC&M Wright Dynamic Lowering Circuit Controller for crane-hoists is well known for its ability to permit accurate, short movements when spotting a load. The operator has complete control of all lowering speed-points. In setting the cope with this 125-ton crane, quick response through fast brake release enables the operator to close the mold carefully—with a minimum number of movements which maintenance men recognize as a contributing factor to reduced up-keep. The Wright Circuit is safe—specify EC&M Crane Control.

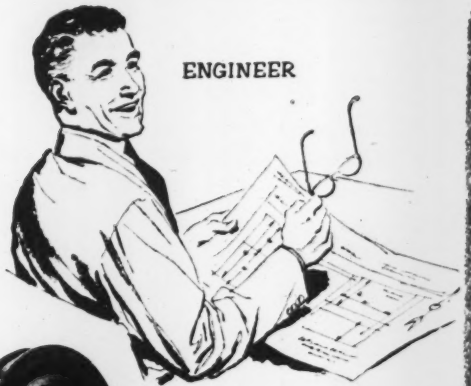
WRITE FOR BULLETIN 921

Photo—Courtesy, Cleveland Crane & Engineering

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

The Blanks They Recommend—and Why



ENGINEER

"In designing our machines, we have to consider both strength and weight. When we need circular steel blanks, we ask Purchasing to get them from Bethlehem. Bethlehem blanks are so strong that we can sometimes use thinner sections. This reduces weight."

METALLURGIST

"Bethlehem has an unusual method of forging and rolling the blanks in a single operation. Tests we've run show homogeneity and very good grain structure. Also, the blanks can be furnished untreated or heat-treated, as we prefer."

MACHINIST

"I get along with 'em fine. They don't give me any trouble. They're free of the flaws that sometimes make you discard a piece and begin all over. Nice easy cutting all the way."

PURCHASING AGENT

"We have to watch costs, and Bethlehem blanks are competitive price-wise. Deliveries dependable, too. And we like the wide range of sizes —10 to 42 in. OD. As a company buyer, I've got Bethlehem circular blanks on my preferred list."

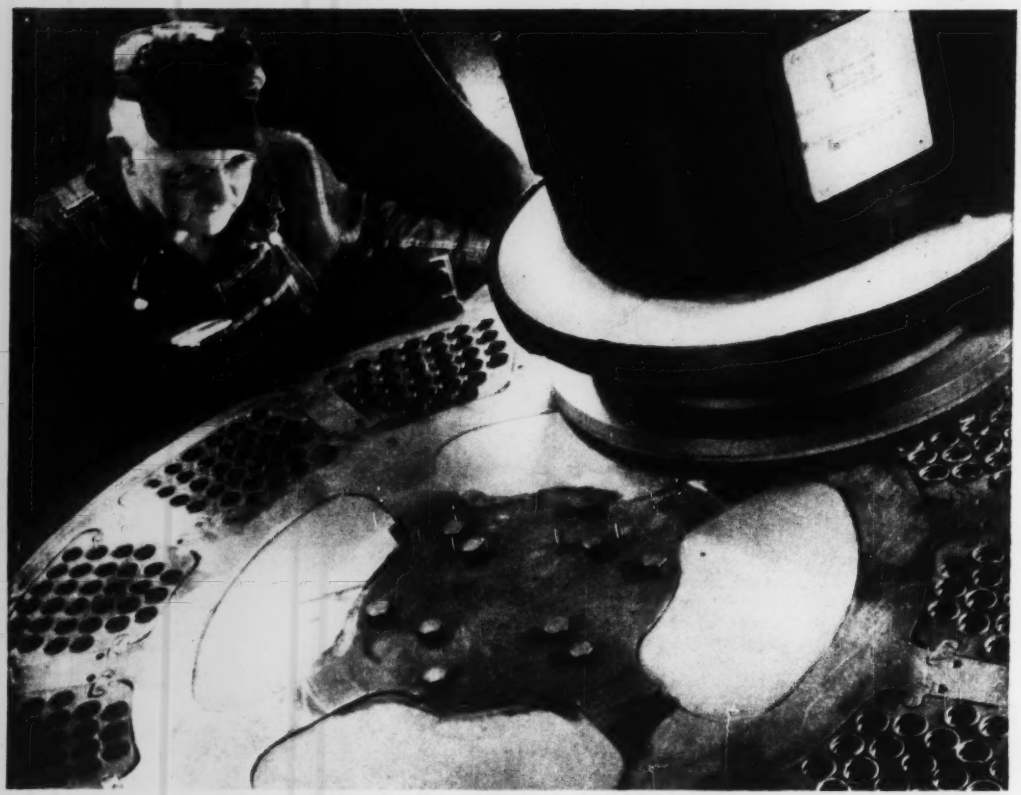
Bethlehem suggests that you, too, request these sturdy steel products when making gears, crane or sheave wheels, flywheels, turbine rotors, tire molds, brake drums, industrial wheels, or anything else of similar nature. Ask for full details—or write for a free copy of illustrated Booklet 216.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM ROLLED-and-FORGED CIRCULAR PRODUCTS



He's "squaring off" to square away your spring needs!

This workman is "squaring off" spring ends on a huge grinding machine. This is one of the many precision operations that make Barium's Cuyahoga Spring Company an outstanding quality *specialist* in coiled wire springs and made-to-order wire specialties, including moulding clips . . . stamped clips that need no bolts, screws or nuts.

Not only will you benefit by Cuyahoga's specialization in springs, you'll also benefit because Cuyahoga is part of Barium Steel Corporation. For Barium is a single source for your steel needs, controlling quality from blast furnace to end product . . . a team of companies providing industry with steel in many forms. No matter which Barium company handles your order, the finest engineering research and product development is available to you from Barium's *staff* engineering force.

Address your steel needs to Barium Steel Corp., 25 Broad St., New York City

Barium

A coordinated effort of 16 companies working in steel

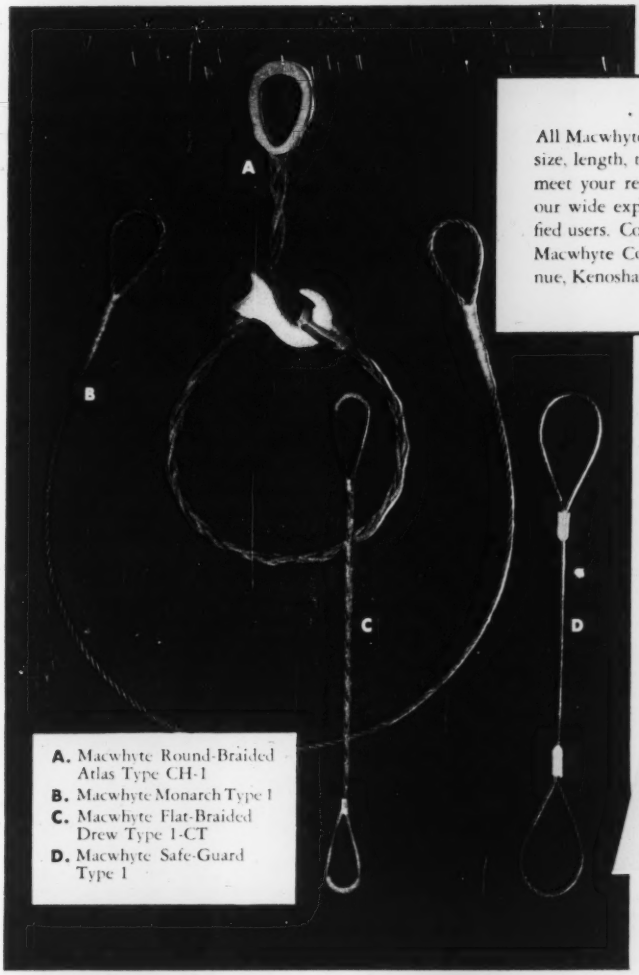
MILL PRODUCTS • SHAPES TO ORDER • END PRODUCTS

BOLTS	STEEL PLATE	PIG IRON	CRANES AND HOISTS	SPRINGS	BOLTS AND NUTS	METAL STAMPINGS
Bayonne Bolt Corporation	Central Iron and Steel Company	Chester Blast Furnace	Clyde Iron Works, Inc.	Cuyahoga Spring Company	Erie Bolt and Nut Company	Geometric Stamping Company

DROP FORGINGS	HEAVY FLAT DIE FORGINGS	AIRCRAFT ENGINES AND PRECISION ASSEMBLIES	MARINE DIESEL AND GASOLINE ENGINES	STRUCTURAL SHAPES AND STEEL FABRICATIONS	BARGES AND TUGS	FABRICATIONS OF ALUMINUM, MAGNESIUM, FIBERGLAS, PLASTICS
Globe Forge, Inc.	Industrial Forge and Steel, Inc.	Jacobs Aircraft Engine Company	Kermath Manufacturing Company Kermath Limited (Canada)	Phoenix Bridge Company Phoenix Iron and Steel Company	Wiley Manufacturing Company	East Coast Aeronautics, Inc.

MACWHYTE SLINGS

Wide variety of sizes and types for your needs



A. Macwhyte Round-Braided Atlas Type CH-1
B. Macwhyte Monarch Type 1
C. Macwhyte Flat-Braided Drew Type 1-CT
D. Macwhyte Safe-Guard Type 1

All Macwhyte Slings are made to order in the size, length, type and body design needed to meet your requirements. Take advantage of our wide experience with hundreds of satisfied users. Complete information, on request, Macwhyte Company, 2912 Fourteenth Avenue, Kenosha, Wisconsin.

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Mill depots: New York • Pittsburgh • Chicago • St. Paul • Fort Worth • Portland • Seattle • San Francisco • Los Angeles. Distributors throughout U.S.A.

MACWHYTE COMPANY
KENOSHA, WIS.

For cranes and hoists use PREformed Monarch Whyte Strand Crane Rope made by Macwhyte.

1425

They rolled away their troubles on this strip pickling line

ON this continuous steel cleaning line—combining shot blast cleaning and pickling—stainless steel strip is passed along over and under rubber covered rolls specified by the G.T.M.—Goodyear Technical Man.

During processing, the steel strip undergoes shot blasting, as well as pickling in 16% sulphuric acid at 185°-190° and 12% nitric-hydrofluoric acid at 150°. The rubber hold-down and carrying rolls rotate in these acid solutions.

Special rubber compounds, specified by the G.T.M., are built into the roll covering to resist this heat and acid action. Result is longer life and more trouble-free service.

Goodyear's rubber rolls resist heat, chemicals, oil, abrasion, or other roll-killing conditions. Each covering is tailor-made to make the roll function as designed. "Superbonding" process permanently bonds rubber covering to the metal core.

Why not discuss *your* roll requirements with the G.T.M. now? You can reach him by writing Goodyear, Mechanical Goods Division, Akron 16, Ohio.

LOOK FOR YOUR GOODYEAR INDUSTRIAL RUBBER PRODUCTS DISTRIBUTOR *in the Yellow Pages of Your Telephone Directory under "Rubber Products" or "Rubber Goods." He handles Hose, Flat Belts, V-Belts, Molded Goods, Packing, Tank Lining, Rubber-Covered Rolls built to the world's highest standard of quality.*

GOODYEAR

THE GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

This Week in Metalworking

STEEL

Vol. 131 No. 26 Dec. 29, 1952

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

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Editorial, Business Staffs—16. Advertising Index—134. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

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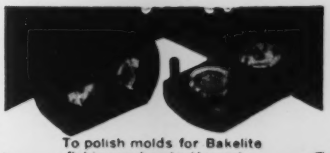

To polish molds for Bakelite fishing reel ends, Horrocks-Ibbotson uses Elgin DYMO grades 45, 9 and 3.

Note high finish on molded parts of reel.

ELGIN DIAMOND

Makes Mold Polishing More Than TWICE AS FAST

...at **HORROCKS-IBBOTSON COMPANY** of Utica, New York, known by sportsmen everywhere for famous fishing tackle. Mold maintenance costs are also reduced by more than 70%. Such savings are natural with Elgin Diamond... precision graded by Elgin at Elgin—home of master craftsmen, delivered in ready-to-use plastic cartridges and color identified for errorless grade identification. You can achieve similar cost reductions in your own shop... assure predictable, superior polishing results with maximum cutting speed. Join the other leaders who...

Finish with Diamond ... ELGIN Diamond!

DYMO ...FOR GENERAL POLISHING | DYMO C ...FOR CARBIDES

ABRASIVES DIVISION DEPT C
ELGIN NATIONAL WATCH COMPANY
ELGIN, ILLINOIS

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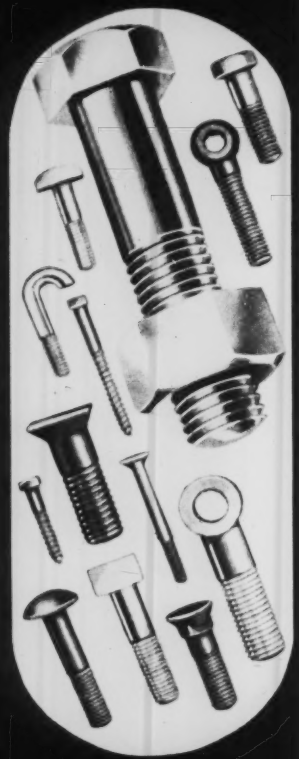
BOLTS·NUTS
STUDS

- Carbon Steel
- Silicon Bronze
- Alloy Steels
- Naval Brass
- Stainless Steel
- Monel Metal



You can depend on a uniform Class 3 fit when you buy Pawtucket threaded fasteners. Standard items or specialties — all Pawtucket products are accurately made in standard dimensions or to your specifications. Heat treating with precision-controlled modern equipment.

BETTER BOLTS SINCE 1882

PAWTUCKET

THE BOLT MAN

MANUFACTURING COMPANY

327 Pine Street Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

Behind the Scenes...

Between Holidays

Geraldine, our cleaning lady who doubles as Night Editor, came by last evening to tell us she still thinks we're wrong about the wine and the water in the puzzle of Nov. 17. She says there should be more wine than water.

We agree wholeheartedly that there should be more wine than water. We've always felt that way about it, but for the answer to this puzzle we must still say (between clenched teeth of course) that there is the same volume of water as wine moved around.

She mentioned, by the way, that we should extend to you, her best wishes for the coming year. We go along with that. We hope you find your new year very gratifying and you can make ours the same by sending us a puzzle once in a while.

Spreading the Word

We just heard that the STEEL word on plant tours is still being circulated. The original article, "Companies Seek Company: Plant Tours Pay Off," is in the August 11 issue of STEEL.

All our reprints are gone. The article was reprinted by the Naval Ordnance Laboratory and the Refractories Institute. Now we receive word that the same article was digested in the November issue of the *Management Review*.

It's nice to see the information so well received and so well read. Next time we attend an open house— we'll expect a royal reception.

The Challenge

Managing Editor Walt Campbell showed us the Program for Management article he has just wrapped up for STEEL'S yearbook issue next week.

Walt has doubled as a platform and dinner speaker lately in addition to his full-time job here. In talking with many people in both management and labor and some who belong to neither he's found that in all the conversation and plans there's one underlying theme.

This undertone indicates that management's greatest challenge is only remotely related to production and profits and sales. It's the challenge to carry the ideas and thoughts of some capable men (our readers included) to the public—to get across the message of industry to the American people.

The whole article has been put in just four pages. It'll take you just 11 minutes to read, and that's assuming you're as slow as we are. We think you'll want to tear out the pages and keep them. It's a sort of sermon on cleaning the mud off the name "capitalism".

In Perspective

We just received our copy of this year's business trends chart from the Excello Corp. Across the top they give the equivalent of $1 billion in 14 different terms. Here are a selected few:

One billion dollars would:

. . . create a pile 60 miles high by placing $1 bills one upon the other.

. . . buy a fleet of new cars extending bumper to bumper from Boston to Miami.

. . . build a $10,000 home for every family in the city of San Antonio, Texas.

. . . take one man 240,000 years to earn at $2 per hour, 40 hours a week.

. . . take the federal government 4 days and 15 hours to spend at the present rate.

Puzzle Corner

In the issue of Dec. 15 we left Al in Reno until we could find out how much dough he had left to get home. Right answer is $29. First in with that one were L. C. Kaye, International Business Machines Corp. and Ralph Pappenheimer, Specialty Device Co.

This week's puzzle was sent in a while ago by F. L. Scott, Baker Oil Tools Inc. It concerns both of our boys Al and Sam. Both of them have a fixed amount of money. If Al gives Sam a dollar, Sam will have twice as much as Al. But if Sam gives Al a dollar they'll both have the same amount. How much does each man have.

Shrdlu

(Metalworking Outlook—Page 35)

A GOLD MINE OF

Job-Proved, Cost-Cutting, Production Helps

Methods and Production Case Records on a wide range of actual operations

FREE

See how *others* cut costs with

MULTIPRESS®

Facts and figures from hundreds of actual users tell *how* and *why* the smooth oil-hydraulic power and control of Multipress cuts production costs. Our Data Log reports on these applications may offer better answers to some of your own production needs.

Multipress offers complete adjustability of ram speed, pressure and stroke length.

Pressures build up instantly as the ram contacts the work . . . there's no hammer-blow impact on work or tooling.

With Multipress Index Table Feeds, work can be loaded on multiple fixtures that index to the press ram automatically at speeds up to 70 per minute — often keeping two or more operators busy at top speed.

Automatic time delay, for ram dwell or hold-down, is easily provided with Multipress.

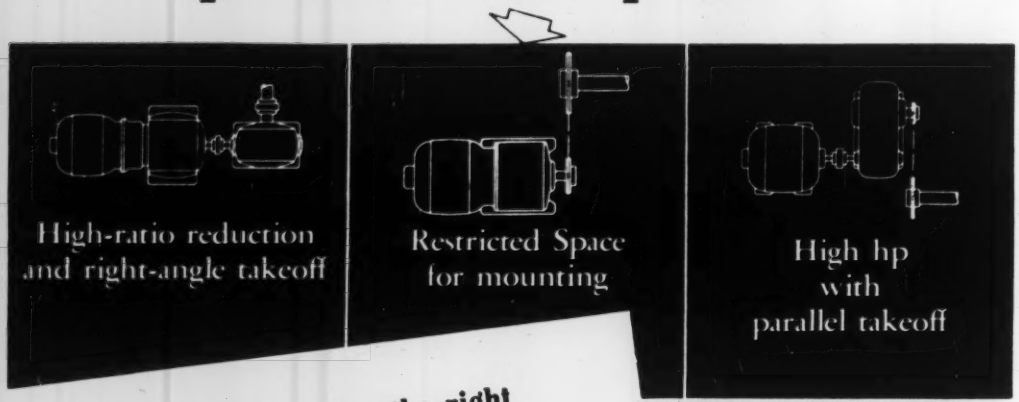
Many other types of valving, ram controls, auxiliary feeds, operating accessories and tooling attachments can be interlocked with the Multipress ram action. Let us send you full details on Multipress.

Write Today for Data Logs on types of operations your production requires.

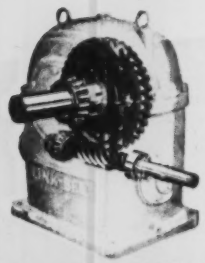
DENISON Hydr OIL ics

The DENISON Engineering Company **1163 Dublin Road, Columbus 16, Ohio**

Is your speed reduction problem in this picture?

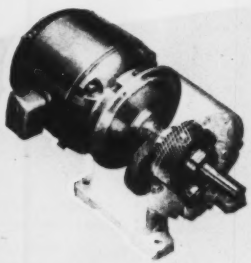


If it is, LINK-BELT has the right reducer for your requirements



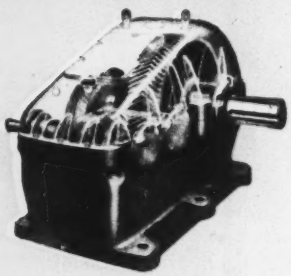
Worm Gear Drive

Reduction ratios: 3.1:1 to 8000:1. Torque: 1400 to 125,000 in. lbs. Output shaft rpm: 0.22 to 564. Drawing shows motorized P.I.V. variable speed and worm gear drives direct-coupled.



Gearmotor

Reduction ratios: 6.2:1 to 292:1. Hp range: 1 to 30. Output shaft rpm: 6 to 280. Drawing at top of page shows gearmotor with roller chain drive.



Herringbone Gear Drive

Reduction ratios: 2.84:1 to 318:1. Hp range: ½ to 1000. Output shaft rpm: 2 to 600. Drawing at top of page shows motor with herringbone gear drive and roller chain drive.

Yes, LINK-BELT builds all 3

HELICAL, Herringbone or Worm gear drive—Link-Belt builds them all. And all are made in the widest range of hp ratings and reduction ratios. Truly a specific drive for every reduction problem.

All of this enables the Link-Belt power transmission engineer to recommend the *one* drive best suited to your requirements. And you can be equally sure that every Link-Belt drive is precision engineered for quiet, economical, long-life service.

Call the Link-Belt office near you for engineering information on any or all of these enclosed gear drives. Send for catalogs.

LINK-BELT

ENCLOSED GEAR DRIVES

LINK-BELT COMPANY, Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices, Factory Branch Stores and Distributors in Principal Cities. 12,801

LANDIS WAYNESBORO

THREAD ENGINEERING DEVELOPMENTS FOR DEFENSE PRODUCTION

MACHINE CO. PENNSYLVANIA • U. S. A.

Landmaco Machine Adapted for Threading U.S. Navy Rockets

A LANDMACO Threading Machine, through special tooling devised by our Engineering Department, was recently adapted for use by a southwestern manufacturer for the precision threading of 5" Mark 6 Navy Rockets.

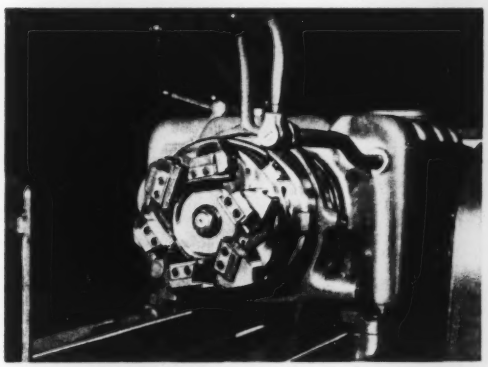
JOB REQUIREMENTS:

Specifications required the generation of 4¾" diameter 12-pitch threads on the rocket head. As a result of the design of the rocket this threading operation had been a trouble spot in the manufacturing process.

Concentricity limits had to be held between thread and the section of the workpiece projecting in front of the thread. It had been difficult to maintain the exact tolerances required. One of the problems arose from the fact that the diameter of the forepart of the projection was larger than the root diameter of the thread. Detailed specifications and engineering drawings of the rocket head are not available for security reasons.

THREADING EQUIPMENT USED:

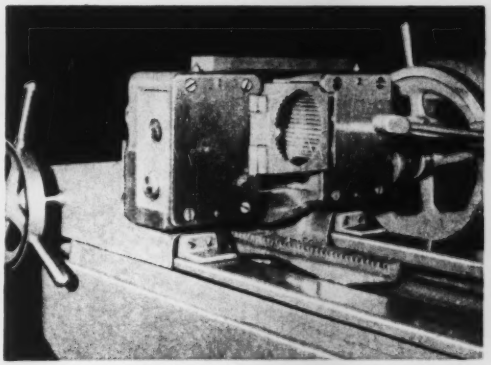
Today precision threads are being cut on these rocket heads at high production rates, and the threads are held to close concentricity. A battery of three 2½" Single Head LANDMACO Leadscrew Threading Machines are used in the operations, each equipped with Special Tooling devised to meet the problems of this specific job.



SPECIAL TOOLING:

1. *40RX LANCO Head.* This head features the use of six chasers, thus distributing the cutting strains over a larger number of threading tools. This results in a finer thread finish and longer tool life.

2. *Receding-type centering pilot.* The bore of each head is fitted with this pilot to maintain close concentricity. The pilot is slightly tapered so that it fits over the front end of the rocket head. Thus, before the work is gripped in the vise, it is engaged by the centering pilot while the head is



open. A relief between the start of the thread and the larger diameter of the projection provides the clearance necessary for the head to close.

3. *Heavy-duty Vise.* It is adjustable both vertically and horizontally. A metal tie is doweled and bolted to the top of the vise as reinforcement to assure maximum strength and rigidity. The vise has round, serrated grips, precision-ground to insure uniform gripping surfaces.

4. *Hammer-blow hand-wheel.* Reduces operator-fatigue to a minimum, precludes slippage of the workpiece and facilitates its removal.

5. *Hand-operated work-stop.* This assures maximum chucking efficiency and uniformity of thread length. The work stop also eliminates one cause of die breakage in that it accurately positions the work axially in the vise to prevent the chasers from striking against work shoulders.

This special adaptation of a standard LANDMACO Machine illustrates the utility of Landis Threading Equipment in the growing expansion of military production. Landis Engineers have helped many manufacturers, just as this one, with their problems in thread production by recommending the proper equipment, and process for the job, and by devising special tooling for the job's unusual requirements. Perhaps your current thread production problem may be solved as successfully as this.

LANDIS MACHINE COMPANY • WAYNESBORO-7, PENNA.

somewhere in your building,
lurking like a cat....
fire is ready to pounce.
In flammable liquids,
electrical equipment, record
vaults. Your surest protection
is a Kidde Fully Automatic
CO_2 Fire Extinguishing System.

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Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

LETTERS
TO THE EDITORS

Digests for MSA

Because of their value to our program, two recent articles have been selected for the Technical Digest Service conducted by the Office of Technical Services of the U. S. Department of Commerce under the sponsorship of the Mutual Security Agency.

The Digest Service is one part of the MSA productivity program which is designed to assist friendly European nations to attain economic self-sufficiency through the improvement of production techniques. By means of the Digest Service it is hoped to acquaint specialists abroad with the wealth of technological data presented in our trade and manufacturing magazines; and thus foster the adoption of better methods and simultaneously increase the interest in and influence of U. S. publications abroad. Naturally full credit to contributing publications is incorporated.

We would like to digest: "Conveyors Boost Machine Tool Production," (Nov. 3, p. 94) and "Better Tooling Gives Interchangeability," (Nov. 10, p. 98).

Gerald L. Sarchet
acting chief, Digest Service
Office of Technical Services
Department of Commerce
Washington

• *Permission granted.—ED.*

New Subscriber Talks Up

As a new subscriber to STEEL, I want to say that I have found the first two issues very good reading. Thank you for your offer of route slips, but we do not need them.

Robert A. Bell
president
Rajah Co.
Bloomfield, N. J.

Editorial Accolade

Let me compliment you. You did an excellent job in presenting the Micro-Step system (Nov. 24, p. 98). We thought your headlines, layout and editing were excellent.

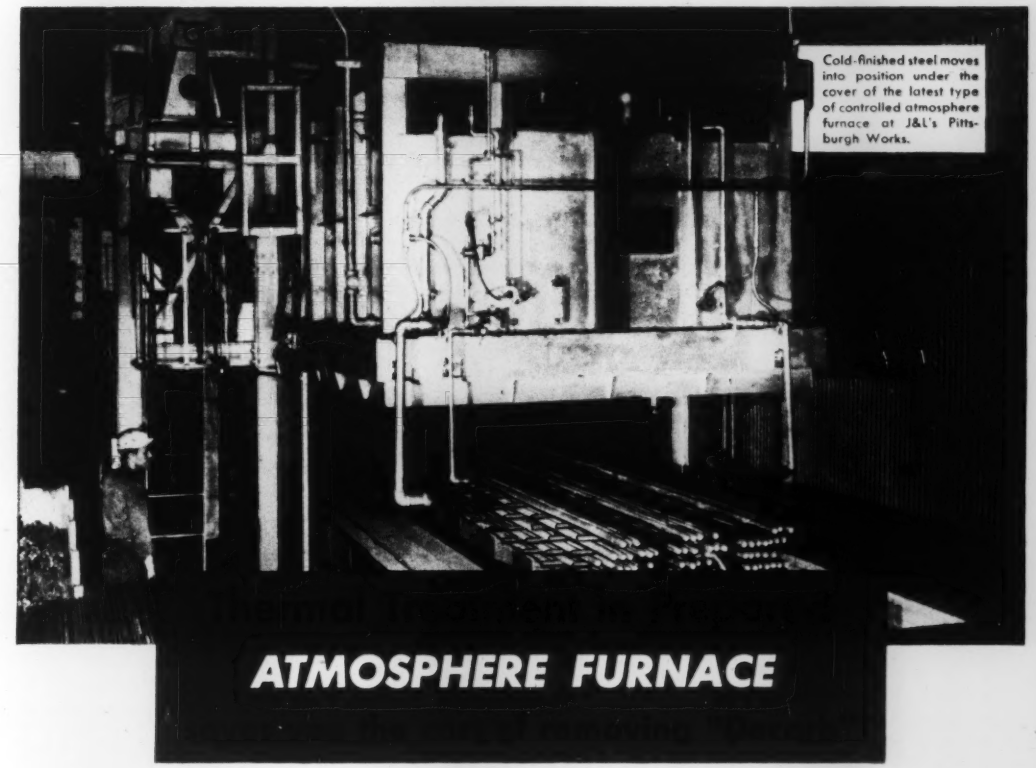
C. H. Rosene
DoAll Co.
Des Plaines, Ill.

Getting the Whole Story

In your Sept. 17, 1951 issue of STEEL, you featured an article entitled "Output Doubled by Improving Drill Press Feed Setup". This article starts on p. 87 and is continued on p. 110. As I have only p. 87 and find the article very

Continued on following page

Let J & L CARBON RESTORED Cold Finished Bars cut your production costs



Cold-finished steel moves into position under the cover of the latest type of controlled atmosphere furnace at J&L's Pittsburgh Works.

ATMOSPHERE FURNACE

Why incur the cost of removing "decarbed" surface from parts requiring high surface hardness? To eliminate these costs and lower your unit production cost, simply order J&L Cold-Finished Carbon Restored Bars.

This furnace is designed to permit other thermal treatments, such as annealing, normalizing, stress relieving and strain drawing. These treatments can be employed to improve machinability or to meet desired mechanical properties.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.

J&L STEEL

Jones & Laughlin Steel Corporation
404 Gateway Center, Pittsburgh 30, Pa.

☐ Without obligation please send me your booklet "Extra Services to Users of Cold Finished Steel."
☐ Please have your representative call.

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TITLE _____
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If you buy Cutting Tools

Are you responsible for purchase or specification of cutting tools —or wear and abrasion-resistant parts? You'll find the *Gorham* Tool Catalog a *helpful time saver!* 120 pages, packed with useful information, describe and illustrate the complete *Gorham* line—*PLUS* an informative section of Engineering Data. Request your free copy on company letterhead.

We also offer the service of *Gorham* field engineers, whose counsel in specification and design for special tooling problems is yours for the asking. Their recommendations are backed by *Gorham's* 25-year background in tool design, manufacture and heat treatment. Write for the name of your nearby *Gorham* representative.

Gorham
TOOL COMPANY
14401 WOODROW WILSON
DETROIT 3, MICHIGAN

LETTERS

Concluded from preceding page

useful to my work, I wonder if I could get a tear sheet.

William C. Anderson
development engineer
Shakeproof Inc.
Elgin, Ill.

• *Sent.—ED.*

7900 Reprints

The layout of the Alden-Mravec article on "Aluminum Good Yardstick for Steel Grain Size" (Nov. 17, p. 96) is fine. We'd like to order 1000 reprints.

R. A. Wagner
Timken Roller Bearing Co.
Canton, O.

I am enclosing our order for 1000 reprints of the article "Watch Charm Mill Specializes on Small Diameter Buttweld Pipe" (Dec. 1, p. 90).

R. W. Brown
vice president
Sharon Tube Co.
Sharon, Pa.

Please accept our order for 300 reprints of the article "Big Tooling Job Completed in Record Time" (Oct. 6, p. 80).

B. J. H. Norris
Norris Engineering Co.
Dallas, Tex.

I am enclosing our order for 3000 copies of the article "Manufacturing Cost Control" (Oct. 27, p. 53). You have certainly demonstrated what can be achieved in a technical article when proper emphasis and thought is given to illustration techniques.

Stuart P. Hall
Ireham & Co.
for Harold F. Howard Co.
Detroit

PLEASE SEND US 100 REPRINTS OF "COMBINED WELDING AND FORMING LOWER APPLIANCE COSTS".

Federal Machine & Welder Co.
Warren, O.

Please send us 2500 reprints of the article "Heating Installation Costs Cut in Half" (Oct. 20, p. 94).

M. L. Keeney
Surface Combustion Corp.
Toledo, O.

• *They're on the way.—ED.*

The Reprint Department

In reading the Nov. 3 issue of STEEL, I became very interested in the article, "High Temperature Metallurgy," by Dr. Bernard Planner (p. 98). I should like to order several reprints of this article and I should appreciate your sending them to my attention.

G. W. Frick
assistant sales manager
Latrobe Steel Co.
Latrobe, Pa.

• *Sent.—ED.*

What SHELL MOLDING means to the users of castings

There are several economic benefits that you can expect when you include the shell molding process in your production plans. This new technique for casting ferrous and non-ferrous metal parts can help you reach new efficiency levels because:

- **Higher percentage of sound, uniform castings results in fewer rejects.**
- **Pieces are cast to closer finished dimensions—tolerances as close as .003 to .005 inches per inch.**
- **Castings have almost pattern-smooth surfaces.**
- **The process minimizes machining operations thereby lowering production costs.**

The thin, lightweight molds used in the shell molding process are made of fine-grained sands bonded with BAKELITE Phenolic Resins. Your foundrymen can tell you what the process can do for your operations. For information about the BAKELITE Phenolic Resins developed expressly for shell molding, write Dept. ER-49.

Casting by Walworth Company
New York 17, N. Y.

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PHENOLIC RESINS FOR SHELL MOLDING

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STERLING'S Patented Guarantees Better

This cut-away view shows one of several Allen-type screws, regularly spaced in the Easymount, engaging the retaining band and rigidly holding the wheel in place. Releasing the screws removes pressure on the band, permitting quick and easy wheel removal.

THE STE NG GRINDING OF THE CLEVELAND

EASYMOUNT Construction CARBIDE TOOL GRINDING

Easymount assembly rigidly retains the wheel while in use, yet permits easy removal anytime. Handles many jobs ordinarily reserved for diamond wheels! Saves time and money!

Sterling's Easymount assures longer than usual wheel life and better grinding. Close, accurate results are possible always because there can be no slippage of the wheel in the Easymount. Important too, is the fact that you need return no backplates--once attached to your machine, the Easymount lasts as long as the grinder, actually cutting the cost of your grinding assembly and resulting in a saving in future Sterling wheel purchases from 18% to 56%!

Sterling's special Easymount Wheel bonds have created new possibilities for obtaining better grinding and longer life from these superior abrasive units. You can now grind both carbide tips and shanks with the same wheel! There is also available a new Sterling bond which has created an Easymount Wheel that has, in many instances, replaced diamond wheels--at much lower cost!

Sterling Easymounts and Wheels have years of experience behind them and are in use all over the country. Try them! Realize the new economy and efficiency that is possible once you have this superior grinding assembly on your machine. Sterling engineers will gladly run a test in your plant.

BEST IN THE TEST—THAT'S STERLING

In a recent test with competing wheels, Sterling's Easymount, fitted with a GC60 J14 VAD Sterling Wheel, was reported by the customer to be the best wheel for wet grinding on carbide. It cut freer and lasted longer--the usual results you can expect on all your jobs on which Sterling's Easymount and Wheels are used in your plant.

Send for Your Free Folder on Sterling's Easymounts and Wheels!

There's important news in this attractive folder on Sterling's Easymounts and Wheels. You'll be interested in the types of Easymount wheels that are not only doing a great job on carbides, but are also very satisfactory for the fast sharpening of tools of various steels. All sizes of Easymounts and Wheels are described in this folder and a listing given of the machines they fit. Complete price data is also included. Write for your copy of this folder today . . . it will be sent at once at no obligation whatever.

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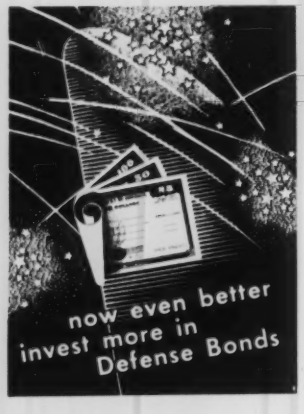

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You can get it now! . . . and we believe it's the best spring steel we've ever made

OUR NEW specialty spring steel plant is in full swing. Equipped with today's most modern, precision machines, we believe we're producing flat spring steel that gives more for your money than ever before.

This new spring steel is tops in uniformity. It saves you preparation time . . . cuts down machine stoppages . . . gives you the greatest number of perfect parts from every foot and pound of steel.

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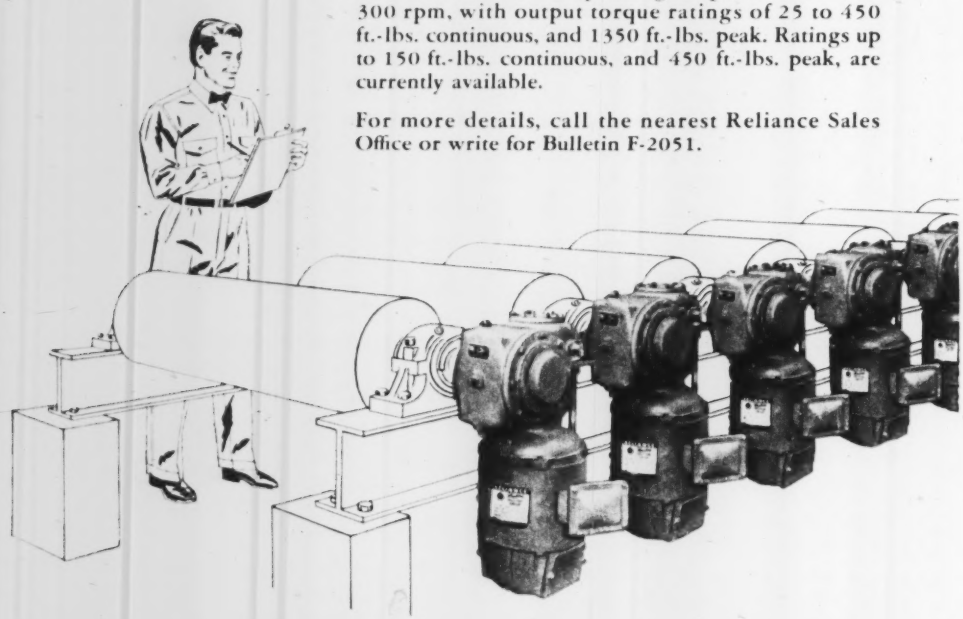
Mounted directly on the roller shaft . . . the Reliance Floating Worm Gearmotor enables roller tables to operate continuously, unaffected by roll warpage or misalignment. External gears and couplings and heavy foundations are no longer required.

The Floating Worm Gearmotor meets requirements for a-c. or d-c. drives operating at speeds from 25 to 300 rpm, with output torque ratings of 25 to 450 ft.-lbs. continuous, and 1350 ft.-lbs. peak. Ratings up to 150 ft.-lbs. continuous, and 450 ft.-lbs. peak, are currently available.

For more details, call the nearest Reliance Sales Office or write for Bulletin F-2051.



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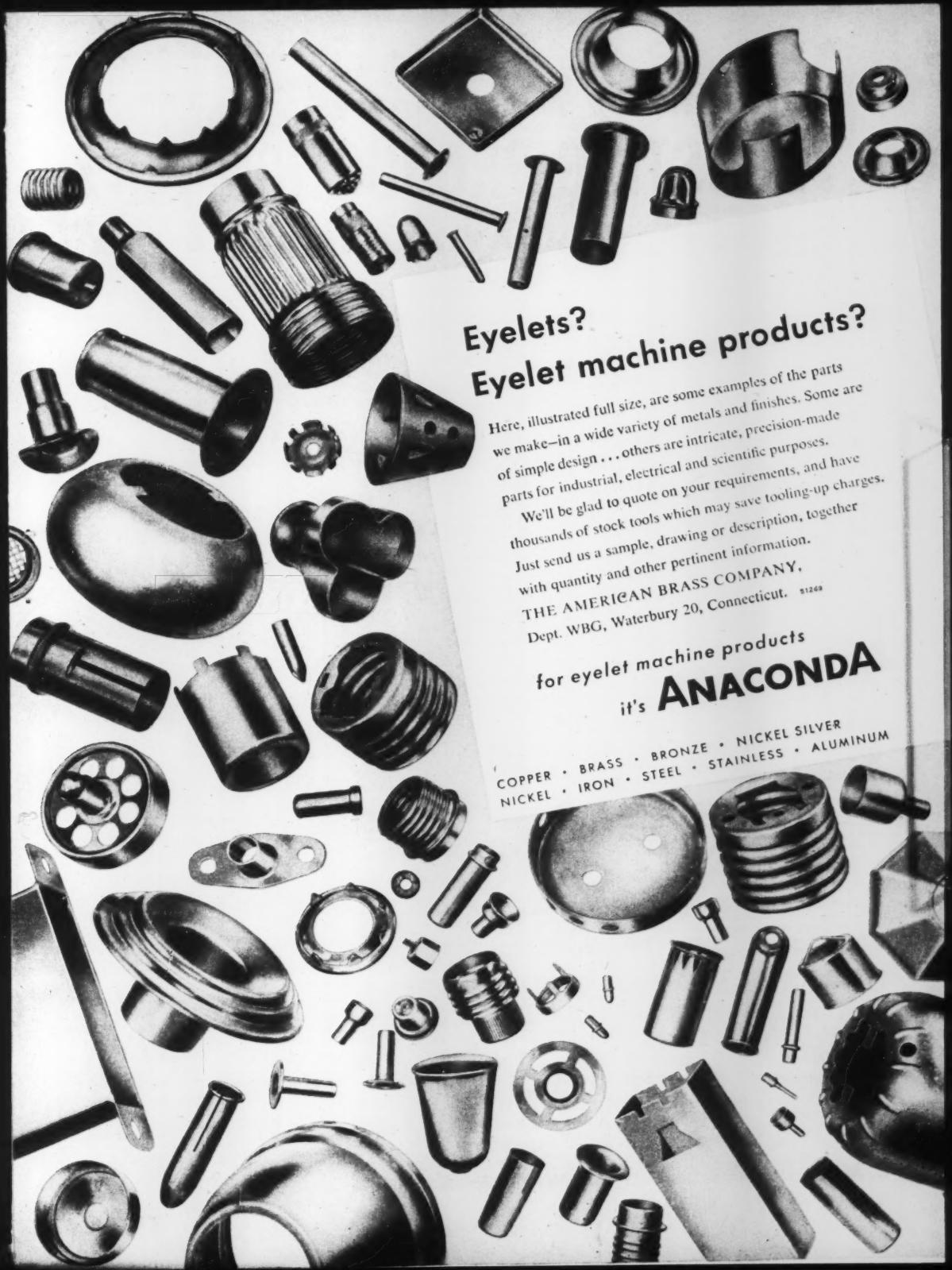
1081 Ivanhoe Road, Cleveland 10, Ohio • *Sales Representatives in Principal Cities*



Eyelets?
Eyelet machine products?

Here, illustrated full size, are some examples of the parts we make—in a wide variety of metals and finishes. Some are of simple design . . . others are intricate, precision-made parts for industrial, electrical and scientific purposes.

We'll be glad to quote on your requirements, and have thousands of stock tools which may save tooling-up charges. Just send us a sample, drawing or description, together with quantity and other pertinent information.

THE AMERICAN BRASS COMPANY,
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PICTURE OF A COMPANY

BOOSTING PRODUCTION 145%

SAVING $18,000 A YEAR

That's right! Saco-Lowell did it with Westinghouse Induction Heating.

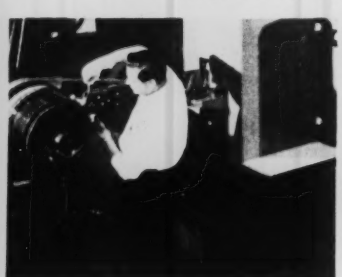
Before installing Westinghouse, the Company had a great deal of trouble hardening critical front rolls for their well-known line of textile machinery. The process they used was costly. It demanded utmost skill, took up space, and required much rehandling of parts. Also, a great deal of straightening was needed after hardening, and rejects were high.

Now, with two standard Westinghouse vertical scanners and a 50 KW RF generator, Saco-Lowell has found the solution to their production problem. Semi-skilled labor, using in-line production techniques, has boosted output 145% . . . reduced floor area requirements to a minimum . . . eliminated eight material handling loads . . . and cut rejects entirely.

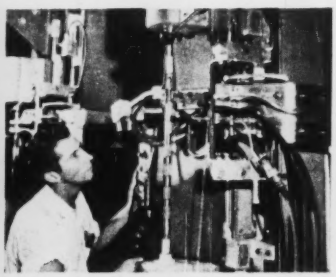
Better, faster, easier—all with Westinghouse induction heating. But the real answer comes at the end of each year . . . $18,000 cash in the bank—profit-producing savings . . . savings that can be yours if you have a hardening, joining, or annealing problem.

So why not take advantage of this money-saving suggestion; investigate Westinghouse Induction Heating Equipment today. Call your nearby Westinghouse distributor, or write to Westinghouse Electric Corporation, Induction Heating Section, 2519 Wilkens Ave., Baltimore 3, Md.

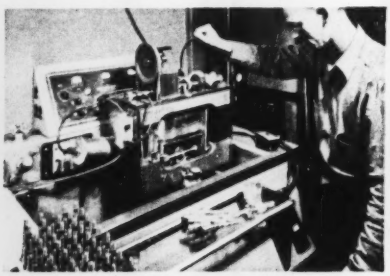
OTHER MANUFACTURERS ALSO PROVE WESTINGHOUSE INDUCTION HEATING EFFICIENT . . . PROFITABLE



Seaboard R. R. uses Westinghouse Induction Heating to solder traction motor coil leads into commutator riser slots. Quick, reliable, efficient, it is also practical and economical for both soldering and unsoldering leads on repair jobs.

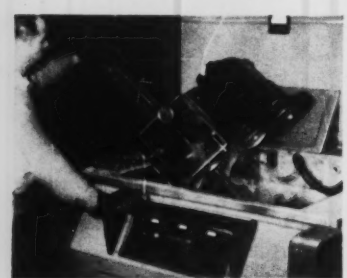


Westinghouse Vertical Scanner . . . self-contained, completely automatic, permits complete or selective case hardening of shafts, rolls, and other cylindrical parts up to 7" in diameter and 36" long.



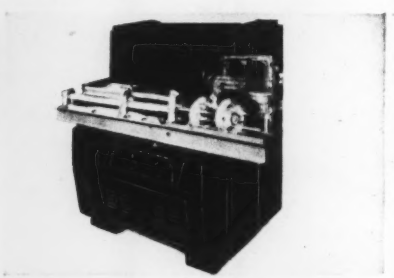
Bell and Gossett had a problem. To carburize a shaft thrust collar required the use of a brass sleeve and 100% inspection. With Westinghouse Induction Heating, quality control replaced inspection, and the brass sleeve was eliminated.

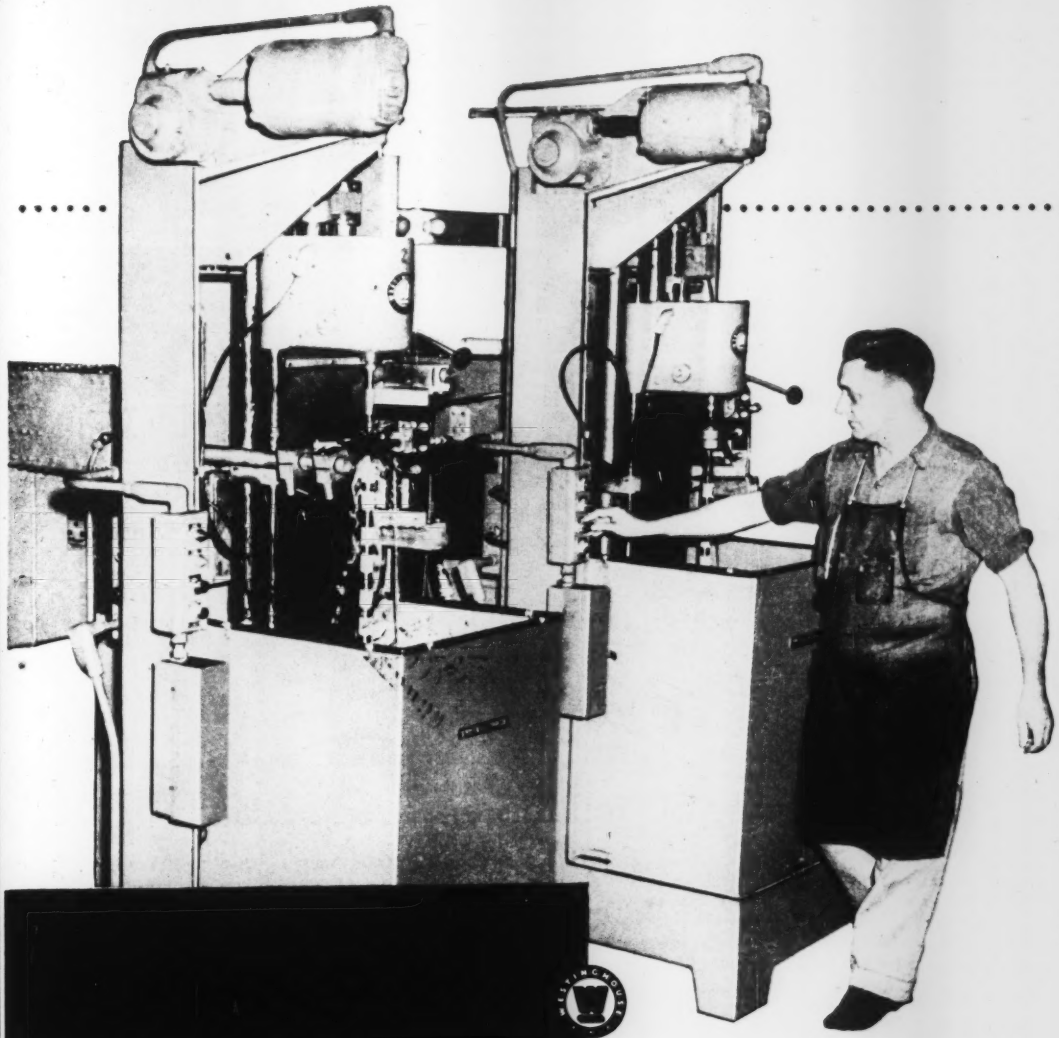
Maytag's two 20 KW RF generators paid for themselves in three months. 400 shafts are hardened an hour, cutting former time by 60%. Straightening and scale have been eliminated entirely, resulting in savings and speed.



Westinghouse Inductall® gear-hardening machine . . . simple, rugged, contour-hardens gears by induction heating—automatically. Spur gears, cluster gears, etc., from 2½" O.D. to 8½" O.D., can be handled economically.

Westinghouse Horizontal Scanner . . . feeds, heats, and quenches, then discharges—all completely automatically. Built to handle parts from ⅝" to 2" in diameter, and 2½" to 20" long at minimum costs, top efficiency.





INDUCTION HEATING

Two booklets help you solve induction heating problems. *For information on Westinghouse Induction Heating, send for either or both of these booklets:*

B-4782 for details on heating, joining, and annealing, with numerous case histories.

B-5259 for details on the Westinghouse Inductall gear-hardening machine.

Westinghouse Electric Corporation,
Induction Heating Section,
2519 Wilkens Avenue,
Baltimore 3, Maryland

Please send booklets B-4782 and B-5259 to:

Name.....

Company.....

Street.....

City.....**Zone**.....**State**.....

A Program for 30 million new Americans

LISTEN to the voices of 30 million new Americans. They are answering the pessimists who say we are threatened with depression because we can't keep our farms and factories busy.

Let these pessimists read the future in the census returns. There is a tremendous upsurge in our population. Last year nearly 4 million babies were born. By 1960 we shall total 170 million people—30 million more than when war ended in 1945. This adds to our domestic market more people than there are in Canada and Australia combined.

Providing for these 30 million new Americans can keep our production machinery going at capacity. They call for new hospitals, schools and churches. Larger families need bigger houses to replace post-war houses that are too small now. More and bigger families need improved home equipment and more new automobiles. In short, to maintain and improve living standards for our children, we must work harder than ever before. To supply the needs of our 1960 population, including adequate national defense, it is estimated that the productivity of the individual worker must increase at least 30%, with additional investment of over 200 billion dollars in capital facilities.

There should be no room in this picture for depression. But we must have economy in government, elimination of waste and extravagance and a reduction of taxes and public debt. If we encourage private incentive, thrift and investment, we can bring about the greatest advance in health, wealth and happiness that America has ever known.

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MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.

FAIRBANKS-MORSE DIESELS CAN ELIMINATE YOUR

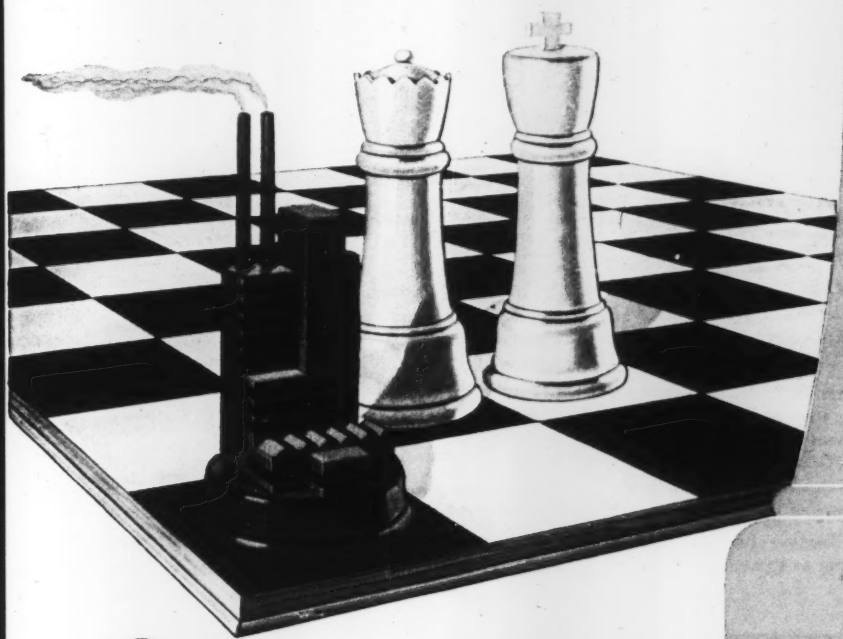
Power Checkmate

Poor power factor, adverse current characteristics, surge loads . . . any one of these conditions can put your plant in a power checkmate. You are then paying a penalty that can mean the difference between profit and loss.

What's the Next Move in Your Plant?

Look at your power problem. Then look at this representative list of advantages brought to you by Fairbanks-Morse Diesel power generation. These are *proved* answers to your problem . . . based on over 50 years' experience in industrial and municipal power generation.

If power has you in a checkmate, write us today, outlining your problem. Fairbanks-Morse Engineering can help decide your next move to put power costs and performance in order. Fairbanks, Morse & Co., Chicago 5, Ill.



Put Your Power Costs and Performance in Order

1 ***Handle Peak Demand*** . . . reduce peak demand values for lower purchased power rates.

2 ***Power Factor*** . . . in-plant power generator can eliminate power factor penalties.

3 ***Emergency Power*** . . . insurance against lost production and damage resulting from line failures.

4 ***Handle Surge Loads*** . . . that may now be affecting current characteristics of entire plant.

5 ***Plant Expansion*** . . . need not be restricted due to lack—or expense—of ample power.

6 ***Useful Heat*** . . . lube oil, water and exhaust heat can be turned from waste to profit.

7 ***Chemical Value*** . . . exhaust gases are high in free nitrogen—available for economical fixation of nitrates, ammonia, etc.

8 ***Insurance Advantage*** . . . of diesel over gasoline engine, for example, will soon pay for installation.

9 ***No Weather Worries*** . . . ice, snow, sleet, wind storms can't stop plant operations.

10 ***Handle Increasing Load*** . . . in-plant power economically; adds to current capacity as loads increase.

11 ***Fuel Economy*** . . . use diesel oil, natural gas or sewage gas for added economy.

12 ***Remote Locations*** . . . distance from transmission lines needn't curtail plant expansion.

13 ***More Compact Power*** . . . Fairbanks-Morse engines give you more power per foot of floor space, more power on present foundation.

14 ***Minimum Attendance*** . . . Fairbanks-Morse in-plant generating sets require far less supervision or maintenance.

15 ***Save Cost*** . . . of running in new line where present transformers and power lines are already loaded.

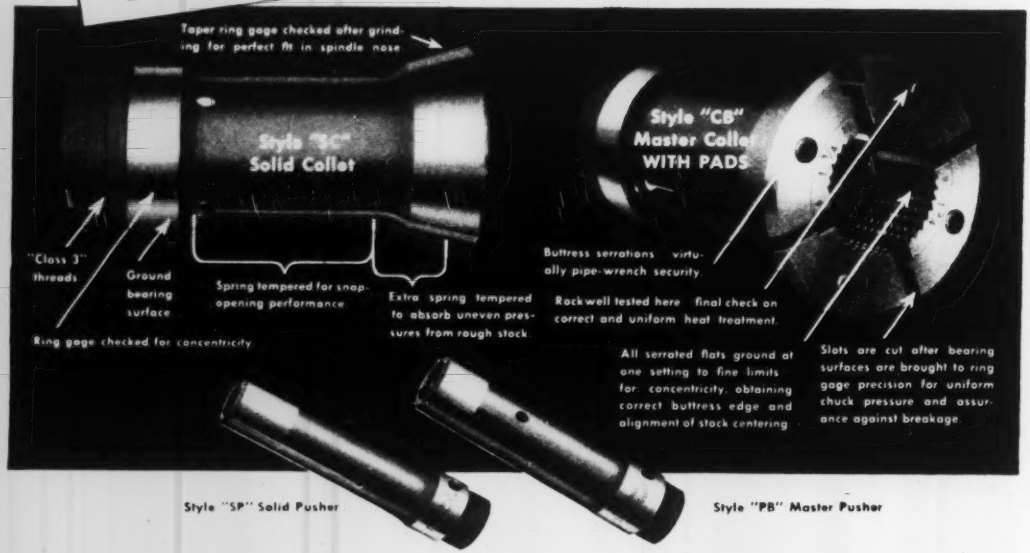
FAIRBANKS-MORSE,

a name worth remembering

DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • ELECTRICAL MACHINERY • PUMPS • SCALES • RAIL CARS • MAGNETOS • FARM-MACHINERY

Memo—to the users of 45,000 Acme-Gridley Automatics

CHECK THESE FEATURES OF NAMCO COLLET PERFORMANCE:


Taper ring gage checked after grinding for perfect fit in spindle nose
Style "3C" Solid Collet
Style "CB" Master Collet WITH PADS
"Class 3" threads
Ground bearing surface
Ring gage checked for concentricity
Spring tempered for snap-opening performance
Extra spring tempered to absorb uneven pressures from rough stock
Buttress serrations virtually pipe-wrench security.
Rockwell tested here final check on correct and uniform heat treatment.
All serrated flats ground at one setting to fine limits for concentricity, obtaining correct buttress edge and alignment of stock centering.
Slots are cut after bearing surfaces are brought to ring gage precision for uniform chuck pressure and assurance against breakage.
Style "SP" Solid Pusher
Style "PB" Master Pusher

National Acme collets and pushers are built by National Acme for National Acme machines and are available only from National Acme.

This is important for you to remember. It is your positive assurance of top performance. These National Acme components are made to function properly on *your Acme-Gridley*—designed on the basis of our fifty years' experience with the stock feed functions of this type of machine.

We offer you no trick designs—just sound engineering practice, enabling us to assume the same responsibility for the high performance of these stock feed components as we do for the machines to which they are engineered. For peak performance specify Namco, both for multiple and single spindle Acme-Gridley automatics and for the pushers, collets and pads used on them.

Complete details and prices on all National Acme collets, pushers, pads and bushings for Acme-Gridley automatics are contained in a separate Stock Feed Components Catalog, No. CP-49. Ask for your copy.

The NATIONAL ACME CO.

170 EAST 131st STREET · CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics: 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • The Chronolog • Limit, Motor Starter and Control Station Switches • Solenoids Centrifuges • Contract Manufacturing

VANCORAM PRODUCTS

PRODUCT	TYPICAL COMPOSITION	APPLICATIONS
ALUMINUM ALLOYS		
Alsifer	Aluminum ..... 20% Silicon ..... 40% Iron 40%	Used principally as a steel deoxidizer and for grain size control.
Deoxidizing Grades	Aluminum ... 85 to 99%	Standard grades.
Silicon Aluminum	Silicon ..... 5 to 20% Aluminum ..... Bal.	For sand, permanent mold and die casting.
Titanium Aluminum	Titanium ... 2½ and 5% Aluminum ..... Bal.	For grain refinement and improved physical properties of commercial aluminum alloys.
Vanadium Aluminum	Vanadium ... 2½, 5, 10% Aluminum ..... Bal.	For control of thermal expansion, electrical resistivity, and grain size of commercial aluminum.
BORON ALLOYS		
Ferro Boron	Boron ..... 14/18% Carbon ..... 1.50% Silicon ..... max. 5.00% Aluminum .. max. 0.10%	For adding boron to steels and irons.
Vanadium Grainal No. 1	Vanadium ..... 25.00% Aluminum ..... 10.00% Titanium ..... 15.00% Boron 0.20%	Practical and economical intensifiers, for controlling and increasing the capacity of steels to harden, and for improving other important engineering and physical properties.
Grainal No. 79	Aluminum ..... 13.00% Titanium ..... 20.00% Zirconium ..... 4.00% Manganese ..... 8.00% Boron ..... 0.50% Silicon 5.00%	
CHROMIUM ALLOYS		
Ferro Chromium Briquettes	Hexagonal. Weigh approx. 3⅜ lb., contain 2 lb. of chromium.	A practical and convenient form for adding ferro-chromium to the cupola.
High Carbon Grade	Chromium ..... 66/70% Carbon 4/6%	For wrought constructional steels and steel and iron castings.
Iron Foundry Grade	Chromium ..... 62/66% Carbon ..... 4/6% Silicon 6/9%	For alloyed cast irons. Ladle addition readily soluble at lower temperatures of cast iron.
Low Carbon Grades	Chromium ... 67/72% Carbon ... .06%, .10%, .15%, .20%, .50%, 1.00% and 2.00% max.	For low carbon chromium steels, especially those with high chromium content, such as stainless steels and heat-resistant types.
Low Carbon Ferrochrome-Silicon	Chromium ..... 39/42% Silicon ..... 40/42% Carbon .... max. 0.05%	Used in stainless steels to reduce chromium oxide from slag and to add chromium to steel.
Experimental Ferrochrome-Silicon Alloy	Chromium ..... 48/52% Silicon ..... 25/30% Carbon ..... max. 1.50%	For simultaneous addition of chromium and silicon to low alloy steels and cast iron.
SILICON ALLOYS		
Ferro Silicon Briquettes	Two sizes, both cylindrical. The smaller contains 1 lb. of silicon; the larger, 2 lbs. of silicon.	A practical and convenient form for adding ferro-silicon to the cupola.
25/30% Grade	Silicon 25/30%	To deoxidize open hearth steels and add silicon to cast iron.
50% Grade	Silicon 47/52%	To deoxidize and add silicon to steels and cast irons.
75% Grade	Silicon 74/79%	For high content silicon steels.
80/85% Grade	Silicon 80/84.9%	For high silicon addition to steel; for slag treatment and graphitization of iron; for making magnesium.
85/90% Grade	Silicon 85/89.9%	
90/95% Grade	Silicon 90/95%	
Silicon Metal	Silicon ..... min. 96%	For making aluminum, other nonferrous alloys and silicones.

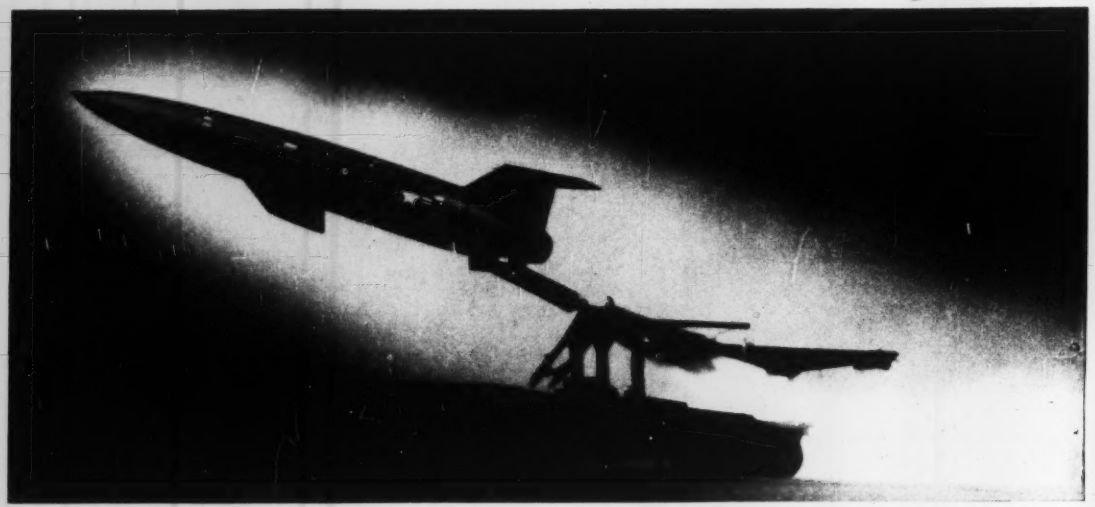
PRODUCT	TYPICAL COMPOSITION	APPLICATIONS
SPECIAL FOUNDRY ALLOYS		
Graphidox No. 4	Silicon ..... 48/52% Titanium ..... 9/11% Calcium 5/7%	Graphitizer for high strength cast irons; reduces chill; supplementary deoxidizer for cast steel.
Noduloy No. 12	Magnesium 10.5/13% Copper ..... 15/18% Silicon ..... 37/41% Iron ..... Bal.	Magnesium-containing alloys for addition to molten cast iron for manufacture of ductile (nodular) iron.
Noduloy No. 3	Magnesium 13.5/16.5% Silicon ..... 62/67% Iron ..... Bal.	
V-S Foundry Alloy	Chromium ..... 38/42% Silicon ..... 17/19% Manganese 8/11%	To reduce chill and increase strength and hardness of cast iron.
TITANIUM ALLOYS		
Ferro Titanium High Carbon Grade	Titanium ..... 15/18% Carbon 6/8%	To control rimming action and deoxidize steel.
Medium Carbon Grade	Titanium ..... 17/21% Carbon 3/4.50%	To deoxidize and to add titanium to killed steels.
Low Carbon Grades 25% Titanium	Titanium ..... 20/25% Carbon .... max. 0.10% Silicon ..... max. 4.00% Aluminum .. max. 3.50%	Carbide stabilizer in high chromium corrosion-resistant steels of extremely low aluminum content. Deoxidizer for some steels.
25/32% Titanium Special	Titanium ..... 25/32% Carbon .... max. 0.10% Silicon ..... max. 4.00% Aluminum .. max. 2.00%	Alloy of high titanium-to-aluminum ratio for adding relatively large amounts of titanium to stainless and heat-resistant steels.
40% Titanium	Titanium ..... 38/43% Carbon .... max. 0.10% Silicon ..... max. 4.00% Aluminum .. max. 8.00%	Carbide stabilizer in high chromium corrosion-resistant steels.
VANADIUM ALLOYS		
Ferro Vanadium Iron Foundry Grade	Vanadium ..... 38/42% Silicon ..... 7/11% Carbon ..... about 1%	Imparts remarkable improvement in physical properties of iron with no sacrifice of machinability.
Grade A (Open Hearth)	Vanadium .... 50/55% Silicon ..... max. 7.50% Carbon ..... max. 3.00%	For low vanadium steels and vanadium cast irons.
Grade B (Crucible)	Vanadium .... 50/55% Silicon .... max. 3.50% Carbon ..... max. 0.50%	For tool steels and other high vanadium steels requiring a limited silicon addition.
Grade C (Primos)	Vanadium ..... 50/55% 70/80% Silicon ..... max. 1.25% Carbon ..... max. 0.20%	For making the highest vanadium and the lowest silicon addition to tool steels.
Vanadium Metal 90% Grade	Vanadium ..... 91.15% Aluminum ..... 2.25% Silicon ..... 0.50% Carbon 0.17%	For special iron-free (non-ferrous) or low iron alloys or low impurity ferrous alloys.
95% Grade	Vanadium ..... 95.18% Aluminum ..... 2.00% Silicon ..... 0.27% Carbon 0.40%	Principally for research on the properties of pure alloys. For use in applications where very low iron content is essential.
Vanadium Pentoxide, Tech. Fused Form	V_2O_5 ..... 88/92%	A source of vanadium in basic electric furnace steels. A base for numerous chemical compounds.
Air-Dried Form	V_2O_5 ..... 83/85%	Base for chemical compounds.
Ammonium Meta Vanadate, Tech.	NH_4VO_3 .... min. 99%	For making sulphuric acid, synthetic organic compounds and vanadium chemicals.

Also special alloys, chemicals and metals of Aluminum, Chromium, Silicon, Titanium and Vanadium.

VANADIUM CORPORATION OF AMERICA

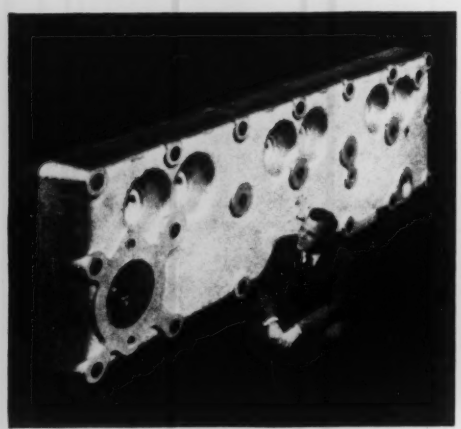
420 LEXINGTON AVENUE, NEW YORK 17, N. Y. • CHICAGO • DETROIT • CLEVELAND • PITTSBURGH

Here's where
CARBORUNDUM *is going with*
"man-made minerals"



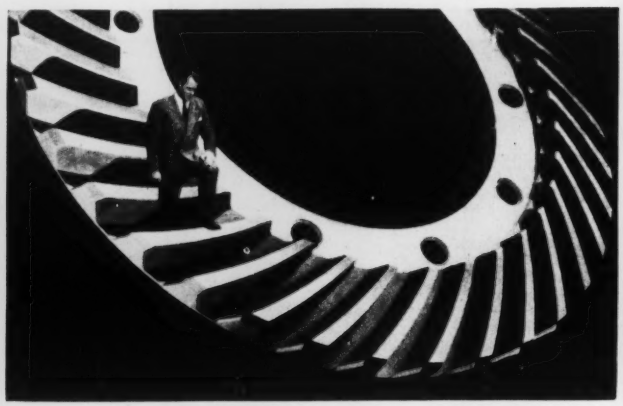
ROCKET EXHAUST LINERS are among the developments by CARBORUNDUM that take over where ordinary materials are inadequate to the task. Produced from *"man-made minerals,"* this super refractory product is highly resistant to the extremes of abrasion and high temperature produced at the rocket nozzle. Super Refractories have been developed by CARBORUNDUM to increase output and reduce operating costs where high temperatures, resistance to abrasion, corrosion or erosion are important factors.

Made by the Refractories Division



CASTINGS ARE IMPROVED in machinability when FERROCARBO, a deoxidizer used in metallurgical processes, is added to the molten metal. This product by CARBORUNDUM is effective in producing the clean castings essential to today's unusual requirements.

Made by the Bonded Products and Grain Division

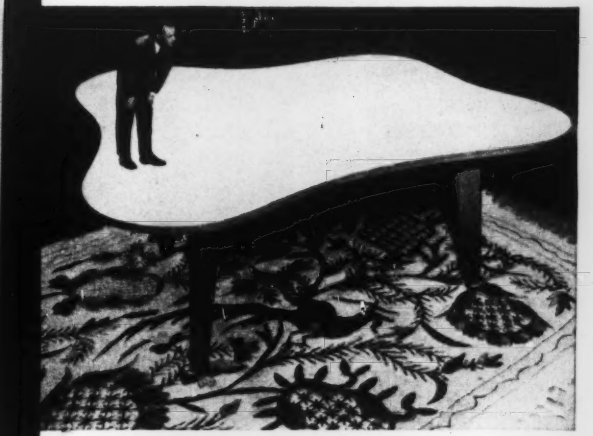


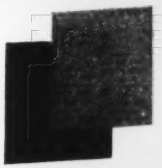
POWDER METALLURGY is a field of interesting new developments. These gears are produced by sintering powdered metal in furnaces equipped with GLOBAR silicon carbide electric heating elements. Having extremely high electrical resistance and no known melting point, the heating elements make it possible to attain high heats under accurate control.

Made by the GLOBAR Division

ABRASIVE BELT LIFE WAS DOUBLED in many applications following the recent introduction of our "61" serrated rubber contact wheel. With this wheel abrasive belts not only retain effective cutting action far longer; they also produce more uniform finishes and turn out more work at less cost.

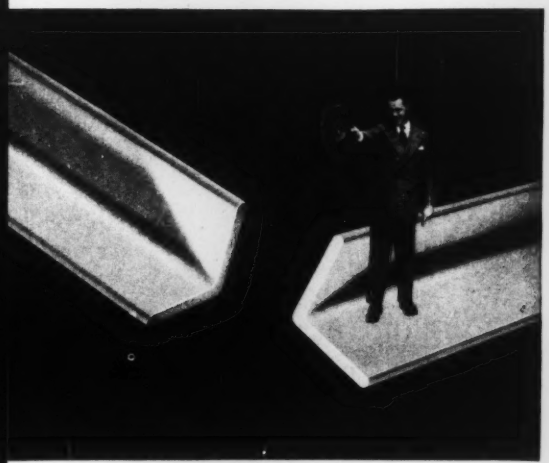
Developed by the Coated Abrasives Division

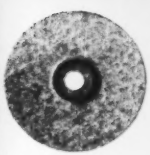




FURNITURE MAKERS are now using the new extra-hard finishes for increased beauty and durability, aided by RED-I-CUT Waterproof Abrasive Paper developed by CARBORUNDUM. This tough new paper cuts faster, gives a better finish and, as an enthusiastic shop owner expressed it, "more mileage than anything we have ever used."

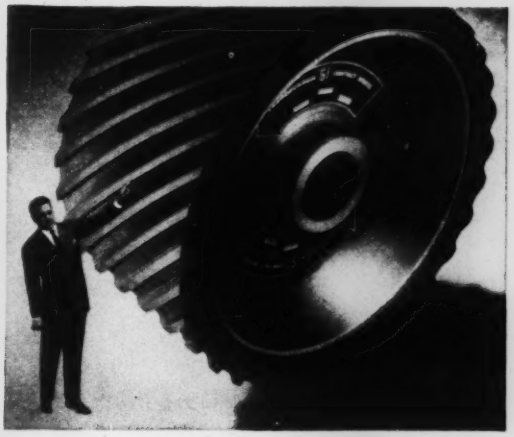
Produced by the Coated Abrasives Division





SMOOTHER, FASTER CUTTING is subject to unending investigation by CARBORUNDUM. In this field a unique combination of cotton fibres, selected abrasive grains and specially developed organic bonds is now used to produce "MX" abrasives in rigid form. These are exceptionally safe and fast in portable cut-off, deburring, general purpose grinding and similar work. They leave a smooth finish as they cut.

Made by the Bonded Products and Grain Division



Searing flame and erosive gases make life incredibly short for uncooled rocket blast tubes.

Problem without precedent: how to protect the tubes without using costly alloys. Experiment, testing and imaginative thinking resulted in a solution by CARBORUNDUM—molded super refractory liners. Molded, then baked, they must emerge from the oven with tolerances of which a machinist might be proud.

Problems without precedent are the kind we like. In fact our business was born with the invention of a material without precedent, the first "man-made mineral." This was silicon carbide, a product of the electric furnace, which has since become familiar the world over in products by CARBORUNDUM.

Working with characteristics that no mineral in nature offers economically in equal degree, or in the same combinations, CARBORUNDUM has made silicon carbide and aluminum oxide useful to industry in a great diversity of services. A few of these are illustrated here.

If they, or any of the newer forms and applications of "man-made minerals" now under development by CARBORUNDUM, call up possible new or more effective applications in your field, we invite your inquiry.

Look to

CARBORUNDUM

TRADE MARK

for the real news about "man-made minerals"

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.

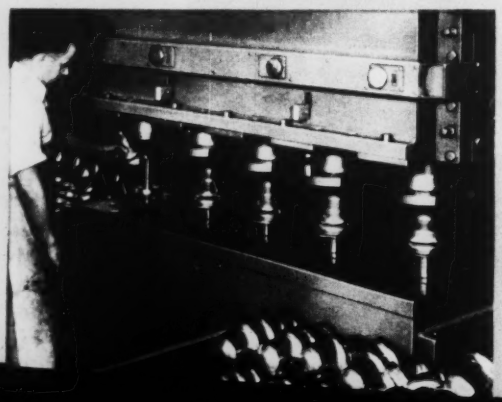
Products by CARBORUNDUM include Grinding and Cutting-Off Wheels, Discs and Sticks... Coated Abrasive Sheets and Belts... Waterproof Abrasive Paper... Abrasive Grain and Powders and other abrasive products... Electric Heating Elements and Ceramic Resistors... Grain and Briquettes for deoxidizing steel and iron... Super Refractory Bricks, Special Shapes and Cements... Porous Filter Media and Diffusers—and are marketed under the following trademarks:

CARBORUNDUM • ALOXITE • MX • RED-I-CUT • GLOBAR • FERROCARBO CARBOFRAX • ALFRAX • MONOFRAX • MULLFRAX

NIAGARA

SERIES B
GAP FRAME Double Crank Presses

Niagara B-4 x 72 Press at the General Machine Works in Los Angeles. It is shown here fitted with two dies for forming operations on an automatic deflector.



The same press as shown above arranged with dies for redrawing projectile parts in 5 steps. Shells are transferred manually from die to die.

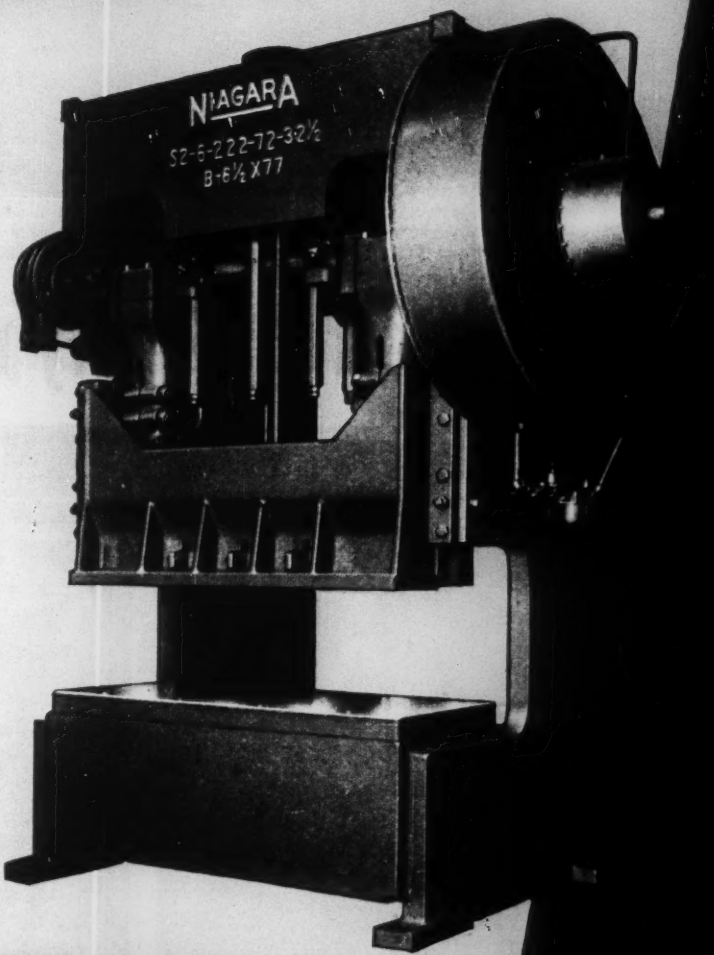
NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

Manufacturers of a complete line of sheet metal working equipment ranging from small hand tools up to large power operated machinery.

Versatility and High Production

- Gap frame convenience with double crank width.
- Ideal for long progressive dies or multi-station dies.
- Rear of press open for full accessibility.
- One piece welded steel frame for maximum rigidity and long die life.
- Exclusive Niagara Sleeve Clutches for maximum productive strokes per minute and minimum maintenance cost.
- Niagara cushions for drawing operations.
- Automatic feeds for high production jobs.

Write for Bulletin



Niagara B-6½ x 77 Gap Frame Double Crank Press. Air actuated, electrically controlled sleeve clutch with friction clutch convenience and sleeve clutch economy. Air releasing brake. Clutch and gearing operating in a bath of oil. Air counterbalance for slide with surge tank over-size cylinder and pressure regulating valve to compensate for various weights of dies. Cross bar knockout in slide. V-belt motor drive.

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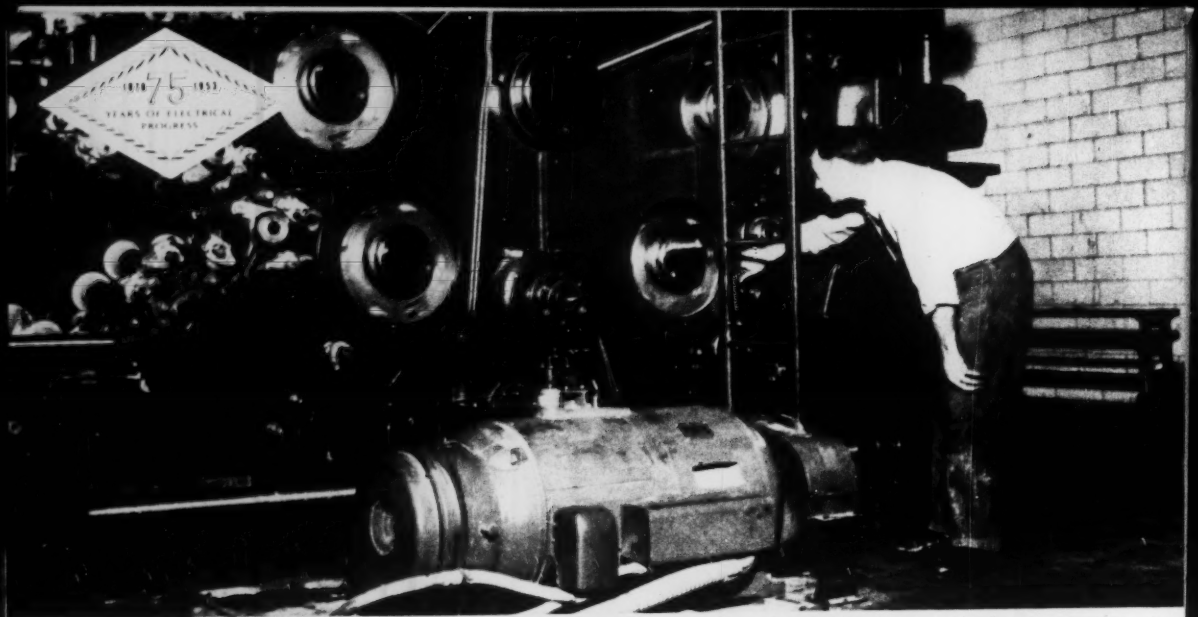
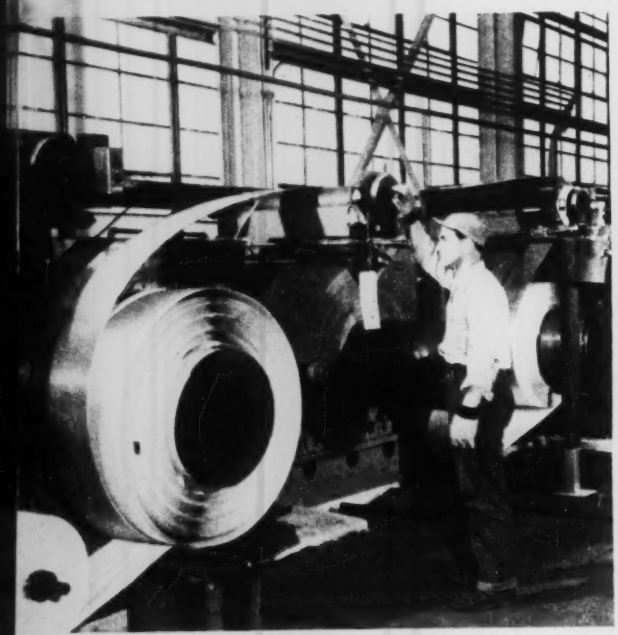
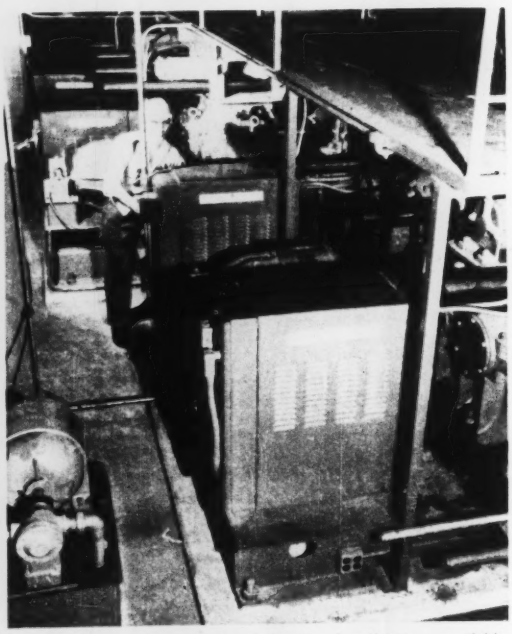


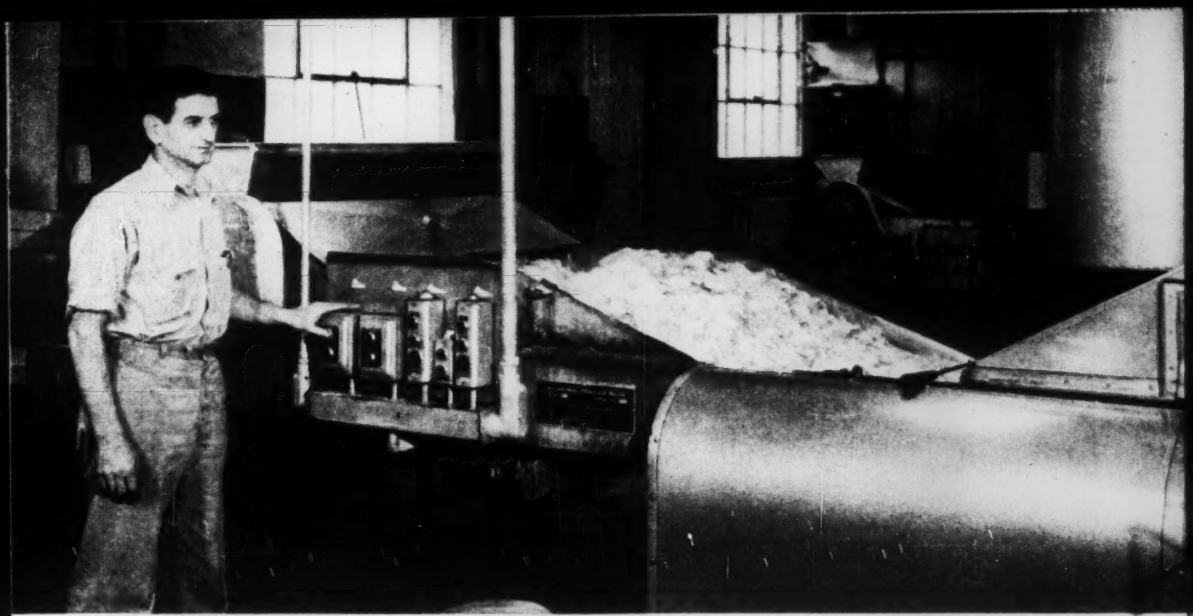
G-E ACA MOTOR is the main drive on this five-color press at Alford Cartons, manufacturers of folding boxes, Ridgefield Park, New Jersey. Working from AC current with no conversion equipment required, the ACA Motor is the low cost way to Adjustable-speed Drive performance. You get stepless speed adjustment within a speed range of from 3 to 1, 6 to 1, and 20 to 1.

Make your machinery more versatile



G-E SPEED VARIATOR boosts winders ("spooling" chrome strip steel at Wallingford Steel Co., Wallingford, Conn., handles all speeds from 5 to 70 feet per minute. G-E Speed Varriators, with speed ranges up to 40 to 1, are complete "package" units—available in ratings from 1 to 200 hp. For even greater accuracy and versatility, these drives may include amplidyne or electronic regulators.





G-E THY-MO-TROL* DRIVE at the El-Ge Potato Chip Co., York, Pa., electronically regulates potato chip processing where accurate speed control is extremely important to the finished product. Thy-mo-trol drive is available between 1/10 and 75 hp, offers smooth speed adjustment ranging up to 100 to 1 and can be made to hold regulation as close as $\pm\frac{1}{2}\%$ regardless of changes in voltage.

with a G-E Adjustable-speed Drive!

G-E ADJUSTABLE-SPEED DRIVES offer you the chance to get the most from your machinery investment. You can step up production, minimize material waste, improve product quality, and enjoy the ability to produce a greater variety of goods.

THERE IS A G-E ADJUSTABLE-SPEED DRIVE FOR YOU. Whether you need speed regulation within $\pm\frac{1}{2}\%$ or $\pm 10\%$ you can get an economical Adjustable-speed Drive from the full G-E line. From the G-E ACA motor which requires but a simple twist of a dial . . . to the G-E Thy-mo-trol drive which permits precise electronically controlled drive speeds . . . General Electric manufactures a drive that will enable you to produce better and more uniform products. Packaged drives are available in sizes from 1/40 to 200 hp. Depending on hp, speed ranges are available from 3 to 1 up to 100 to 1.

FOR FULL INFORMATION consult your nearest General Electric Apparatus Sales Office. Your G-E Sales Representative will be glad to recommend the most economical drive best suited to your operation. For printed information on the complete line of Adjustable-speed Drives, use the coupon.

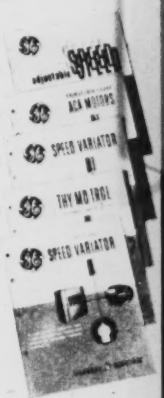
*Reg. Trademark of General Electric Company

You can put your confidence in—

GENERAL ELECTRIC

LET G.E. HELP YOU PICK THE RIGHT DRIVE

Because only General Electric makes **all major types** of electric adjustable-speed drives, it is best qualified to help you select the **right drive.** Send for these informative bulletins.



☐ **A.** This 26-page manual describes **all** four types of drives and where to apply them. Bulletin GEA-5334.

☐ **B.** Lower cost, simplest a-c drive. Bulletin GEA-4883.

☐ **C.** More flexibility, moderate cost. Bulletin GEA-5335.

☐ **D.** Top performance, 1/70 75 hp. Bulletin GEA-5337.

☐ **E.** Top performance, 1-200 hp. Bulletin GEA-5336.

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Please send me the bulletins checked
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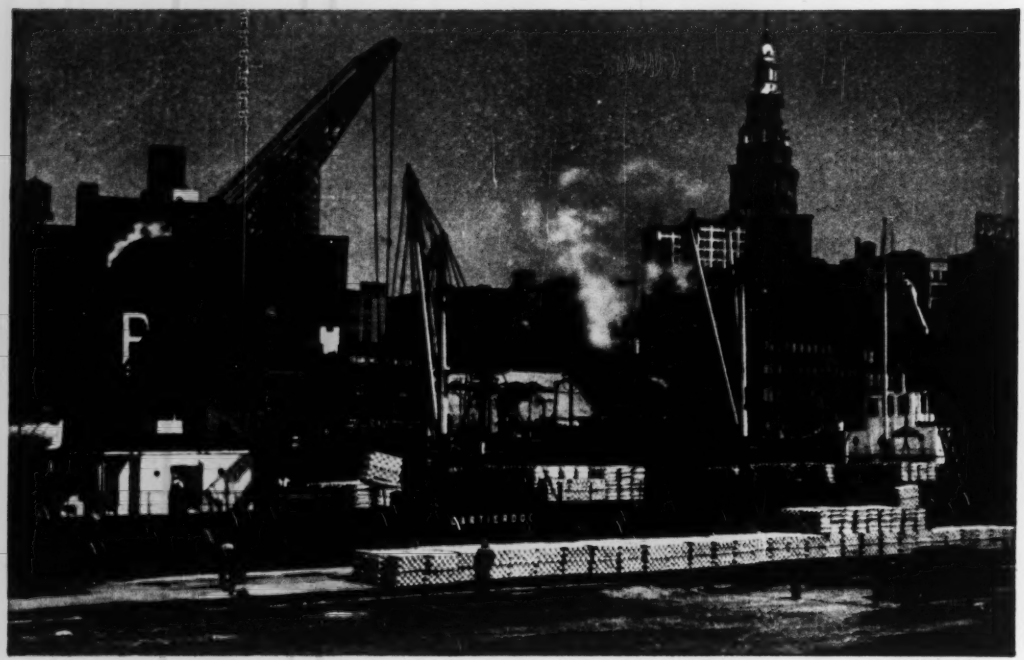

500 TONS OF LIGHTNESS

—and more coming!

Those cranes on the Cleveland waterfront are unloading aluminum ingot produced by the Aluminum Company of Canada, Limited ("Alcan") — whose products we distribute.

From this dependable source, millions of pounds of aluminum per year are shipped to American fabricators. A desirable, economical supplement to U. S. production, Alcan aluminum helps to keep more than a million people busy in foundries and fabricating plants in the United States — busy turning out thousands of lightweight, long-lasting products for defense, industry, farm, and home.

But even that much aluminum isn't enough to satisfy the demand. So in Kitimat, British Columbia, Alcan is building a new plant, which in its first phase will provide 200 million pounds more aluminum per year.

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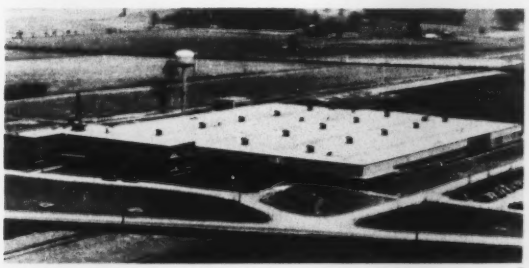
If you sold **electric hoists** would you call here?

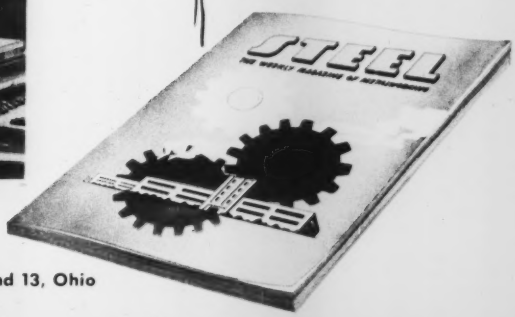
A BARREN FIELD like this one wouldn't get a second glance from any one of your salesmen . . . but the field disappeared just three years ago. *Today* a metalworking giant has grown on this spot . . . a flourishing outlet for your products . . . the modern plant shown below. Here is one of hundreds of new metalworking plants that didn't exist 5 . . . 3 . . . even 2 years ago. These represent a whole *new market* added to the world's biggest industry. It's a fast-growing market that offers you a tremendous opportunity.

STEEL Magazine—through its continuing census of Metalworking plants and controlled distribution—enables you to direct your advertising to this new market *as it grows*. Ask the man from STEEL to show you how STEEL matches its circulation to the growth of your metalworking market.



New Lancaster, Ohio, plant of Diamond Power Specialty Corp.

The magazine of the men who manage, operate and buy for the Metalworking industry . . .



STEEL • Penton Building • Cleveland 13, Ohio

PROTECT BACK-UP ROLL NECKS

When you have *Texaco Regal Oil* in the circulating system, your back-up roll necks get the best possible protection against heavy loads and high temperatures. *You* get trouble-free performance, longer bearing life, lower maintenance costs.

Texaco Regal Oil is turbine-quality oil that resists oxidation and sludging . . . keeps oil lines and bearings clean for uninterrupted flow of clean, cooling lubricant. There is a complete line of *Texaco Regal Oils* to meet your exact requirements.

In your enclosed reduction gears, use *Texaco Meropa Lubricant*. It has outstanding "extreme pressure" properties, plus high resistance to oxidation, thickening and foaming . . . assures longer gear and bearing life, lower maintenance costs. For similar results on open gears, use *Texaco Crater*.

A Texaco Lubrication Engineer will gladly help you run all your machinery more efficiently. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Regal Oils

(HEAVY CIRCULATING OILS)

Faithfully yours

50 TEXACO *for Fifty Years*

TUNE IN TEXACO STAR THEATER starring MILTON BERLE, on television Tuesday nights. METROPOLITAN OPERA radio broadcasts Saturday afternoons.

The Metalworking Outlook

December 29, 1952

Troubles in Zinc

Government planners are concerned about zinc prices which have dropped to 12.5 cents a pound. General Services Administrator Jess Larson fears that facilities producing between 50 and 60 per cent of the domestic zinc are in process of being shut down because of the price situation (p. 117). Remedies being considered are increased stockpile purchases at guaranteed prices, tariff escalations, out-and-out subsidies. Mr. Larson hints that the government likewise will seek to encourage copper production, perhaps abroad. He also favors a higher price ceiling on nickel.

Rail Equipment Prospects Good

Railroad equipment makers are optimistic. Freight car builders estimate that orders for about 240,000 new cars will materialize in the next 24 months. A fleet of 1,850,000 Class I cars may be achieved by Jan. 1, 1955. We have 1,740,000 now, but about 5000 cars are being retired monthly. NPA thinks that by the fourth quarter of 1953, car output should reach 10,000 units a month. Shipments averaged only 6357 a month in the first 11 months of 1952.

Electronics: $4 Billion Business

Electronics sales of more than $4 billion in 1952 will be exceeded in 1953. In 1952, sales of radio-TV receivers, replacement parts, set accessories and transmitting, communications and audio equipment exceeded $1.5 billion at the manufacturers' level. Deliveries of electronic equipment and components to the armed services approximated $2.5 billion. The increasing number of television stations will be a big boon to commercial electronics sales in 1953. More than 200 stations will be in operation by the end of 1953, compared with 117 as of last Dec. 8.

Growth Industry

One aspect of the electronics industry will enjoy particular growth in 1953—microwave communications. Philco Corp. President William Balderston says "microwave communications stepped from the engineering stage into reality in 1952." Industry sales of microwave equipment were about $25 million in 1952, and the backlog of orders now runs into the "hundreds of millions."

LP-Gas Slows Down a Little

Sales of liquefied petroleum gas continued to increase in 1952, although the rate of increase was less than that for the previous year. The future outlook continues to appear bright, say Phillips Petroleum Co. engineers. Total sales of LP-gas in 1952 were an estimated 4.1 billion gallons or 6.7 per cent more than the 1951 volume. That increase is in contrast with annual gains of 25 to 30 per cent recorded in recent years of the industry.

Coming Up: More Steel

Final calculations by NPA reveal that all steel users in the second

Production-Engineering News—p. 71 The Market Outlook—p. 105

quarter will get 24,272,849 net tons of the allocated metal. That's some 3 million tons more than they'll get in the first quarter. Stated demand for April, May and June is about 26.2 million tons, so virtually everyone will get nearly what he wants, with the exception of heavy plates, bars and structurals.

More Oil Tankers?

Any new international crisis like Korea would necessitate immediate launching of a tanker construction program, according to Vice Adm. William M. Callaghan, retiring commander, Military Sea Transport Service. There are no tankers in the government's reserve fleet, and no idle tankers are available anywhere in the world. Civilian tankers would have to be requisitioned for military purposes, with the result that gasoline and fuel oil would have to be rationed in the U.S.

The Base Shifts

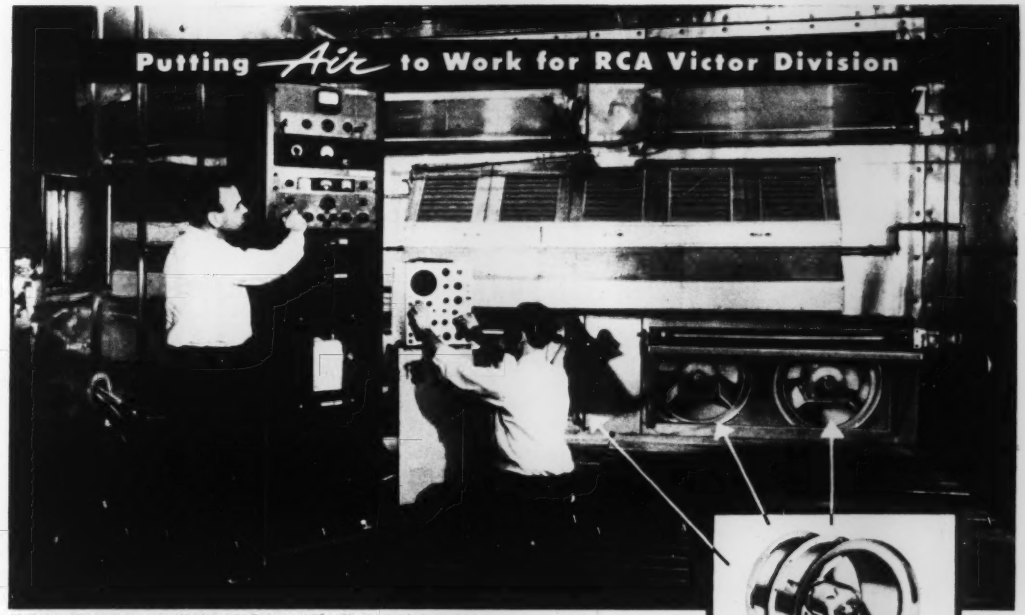
Several thousand wage contracts, covering upwards of 3.5 million workers are based on the Bureau of Labor Statistics' Consumers' Price Index. That index is going from the old 1935-1939 base to a 1947-1949 base, effective with the January, 1953, index, which should be published toward the end of February, 1953. For information on how the change will affect you, contact your local Labor Department representative or, if none is available, Charles Stewart, director of information for the BLS, whose Washington phone number is Executive 3-2420, Extension 302.

Straws in the Wind

Machine tool orders index in November dropped to 210.1 per cent of the 1945-1947 average, lowest since June, 1950, while demonstrated production rate rose to 379.4 . . . OPS denies industry reports that gray iron castings are due for decontrol, but look for ceiling price increases . . . Dormant now is a government plan to build a big plate mill to supplement the production of Lukens Steel Co.'s giant 208-inch mill, the only one of its kind . . . The Wage Stabilization Committee approved a 7 to 8-cent hourly wage increase for approximately 200,000 General Electric Co. employees.

What Industry Is Doing

Warehousemen are preparing for a buyers' market in the second half of 1953 (p. 43) . . . Businessmen need a modern definition of competition to avoid antitrust cases, declares Commerce Secretary Sawyer (p. 44) . . . The U.S. does not require large defense expenditures to maintain a high-employment economy in the next seven years, says the National Planning Association (p. 45) . . . Air freight companies in 1952 logged about 250 million ton-miles as many inventories were put on wings (p. 46) . . . Aircraft production will rise in airframe weight until the third quarter, but unit production for 1953 is expected to remain at 12,000 planes (p. 47) . . . Makers of materials handling equipment in 1952 hoisted sales to $1250 million and hope to do as well or better in 1953 (p. 53).



Westinghouse-Sturtevant fans are used in this special Environmental Test Chamber that duplicates air conditions from sea level to 20 miles up for testing RCA electronic equipment.

HOW DO ELECTRONIC DEVICES BEHAVE

70,000 FEET UP?

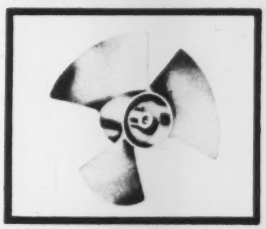
Lives depend on the answers found in this atmospheric testing chamber in type-test laboratories of RCA's Engineering Products Department. But the answers aren't easy to get. For the big problem is to duplicate as accurately as possible the thin, cold air of high altitudes.

The solution? Powerful Westinghouse-Sturtevant Axiflo Fans constantly circulate chilled air, force temperatures down as low as −85°F. Working against a partial vacuum, created to simulate low pressures encountered in the upper regions of the stratosphere, these fans keep temperatures uniform to within several degrees by providing a homogeneous mixture of air throughout the chamber.

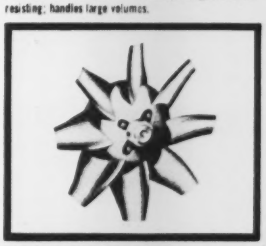
No matter how you want to *put air to work*—whether air handling, air conditioning or air cleaning—Westinghouse offers you a complete line of industry-proven equipment to fill your needs. For complete details, call your local Westinghouse-Sturtevant office. When you do, also ask for new General Catalog 600—a 60-page reference file for Putting Air To Work. Westinghouse Electric Corp., Sturtevant Division, Hyde Park, Boston 36, Mass.

Test Chamber designed and installed by Tenney Engineering, Inc., Newark, N. J.

Axiflo Pressure Fans find wide use throughout industry because of adaptability to duct systems and for discharge against high winds.



3-Bladed Aluminum wheel is non-sparking, corrosion-resisting, handles large volumes.

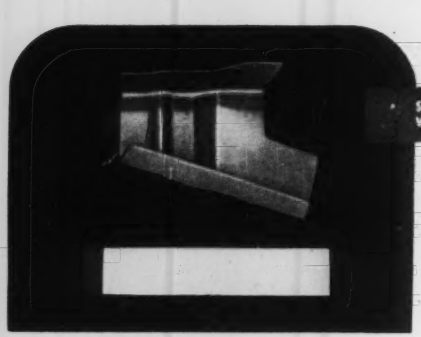


8-Bladed Steel Wheel is non-overloading, quiet and stable, ideal for high temperatures.

YOU CAN BE SURE... IF IT'S Westinghouse

J-80267

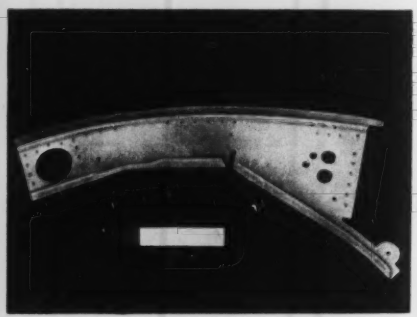
AIR HANDLING

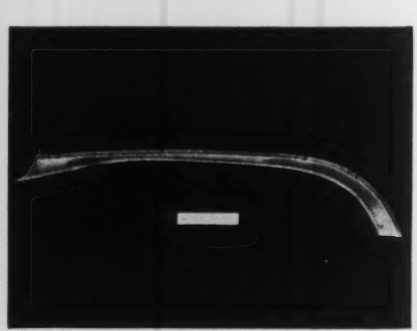


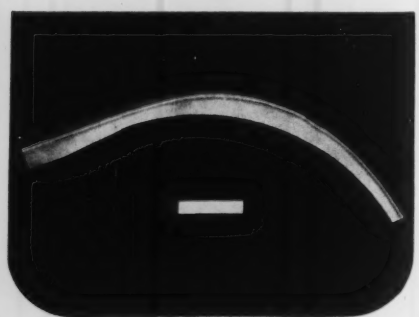
Stainless structural parts for airplanes. White rule represents 6 inches.

50% GREATER DESIGN STRENGTH

With Armco 17-7 PH







Vital formed structurals in certain airplane fuselages formerly were made of Type 301 half-hard temper stainless steel. Here is what the manufacturer gained by changing over to Armco 17-7 PH Stainless Steel:

50-94% INCREASE IN YIELD STRENGTH

Instead of a yield strength in tension of 110,000 psi minimum, he had his choice of yield strengths as high as 165,000 psi minimum in finished parts.

Yield strength in compression could be increased correspondingly from 85,000 psi to as high as 165,000 psi minimum.

23% INCREASE IN TENSILE STRENGTH

Ultimate tensile strength of the finished structural parts could be increased from 150,000 psi minimum to as high as 185,000 psi.

IMPROVED WORKABILITY

Fabrication difficulties were also overcome. Half-hard temper Type 301 must be worked in the hard condition. With an elongation of only 15-18 per cent in 2", it is difficult to form and results are often inconsistent.

On the other hand, Armco 17-7 PH may be worked in the fully annealed condition and hardened by heat treatment *after fabrication*. With an elongation of 20-40 per cent in 2", it will take far more severe forming than Type 301, half-hard. Its high strength is developed through a double low-temperature heat treatment of 1400 F plus 950-1050 F. Scale developed in heat treatment comes off readily in sandblasting.

This is but a thumb-nail sketch of the advantages of Armco 17-7 PH in structural applications. Write for complete information on this precipitation-hardening chromium-nickel stainless steel.

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Export: The Armco International Corporation

ARMCO STEEL

Exhilarating Challenge

As men approach the yearend, they are prone to look over events of the last 12 months, to consider what was good or bad and to indulge in conjecture as to what lies ahead.

From the standpoint of the metalworking industry, 1952 brought forth an odd assortment of happenings that were both bitter and sweet. On the sour side were President Truman's attempt to seize the steel industry, the unnecessary two-months' strike of steel workers, the complete hoax of wage stabilization and near-hoax of price stabilization, indecision and uncertainty as to what and how much actually was required for the defense effort and some justifiable and much unjustifiable scarcity of materials.

On the favorable side were a spectacular increase in steelmaking capacity, an unprecedented advance in technology, prompt action of the Supreme Court in ruling that the seizure of steel was illegal, the rapid recovery of industry from the steel strike, the almost unanimous demand—late in the year—for a removal of wage and price controls and the November elections which will place a new administration in charge of the federal government on Jan. 20.

Weighing the pluses and minuses of 1952, one must conclude that the year witnessed a definite shift from left-of-center toward center in the attitude of the public. This practically guarantees that in 1953 there will be an attempt to reduce government paternalism, expenditures, taxes and controls. To the extent that such attempts are successful, the metalworking industry may find itself more subject to natural economic laws and less beholden to socialistic directives than at any time in a decade or more.

This will challenge management in 1953 to revive talents that long have been dormant. For too extended a period government regulations, pseudo crises and inflationary factors have held an umbrella over inefficiency. A return to a buyers' market next year, which seems likely, will find many metalworking companies unprepared for aggressive selling and intelligent market promotion. Real competition is a stern taskmaster, but it offers rich rewards to good management.

Get ready for a new, exhilarating and provocative challenge in 1953!

Happy New Year!

E. L. Shaner

EDITOR-IN-CHIEF

11TH HOUR ADMISSION: Eyebrows of many industrialists lifted in astonishment last week when Secretary of Commerce Charles Sawyer strongly defended businessmen against the "jungle" of antitrust law. "Is it logical," he asked, "that a big corporation is a menace and a big union a blessing?"

Secretary Sawyer's surprising recognition of

one of industry's age-old gripes came in a letter acknowledging a report on antitrust legislation by his department's Business Advisory Council. He endorsed the council's recommendation that a conference section be established in the Department of Justice where businessmen could get guidance in advance of and perhaps in place of costly litigation. BAC believes that 90 per cent of the antitrust cases could be solved by these preliminary conferences.

This admission by a member of the notoriously antibusiness Truman cabinet that business has been dealt with unfairly in antitrust actions simply confirms a complaint that has been voiced by industry for decades. Away back in the twenties, Herbert Hoover, then Secretary of Commerce, beseeched Attorney General Harry M. Daugherty to set up a bureau in the Department of Justice where businessmen could get a ruling as to whether or not a contemplated practice violated antitrust law. No such sensible service has been provided even to this day.

Widespread recognition of this long-standing injustice should be a cue to the incoming administration that clarification of the Department of Justice policy on antitrust cases would be a boon to the nation's economy.

PERTINENT STATISTICS: Just what prompts Secretary Sawyer to repudiate Trumanite policies on the eve of a change in administration is debatable. However, what motive other than honest conviction would cause him to say that much of the money intended for aid in Europe has been wasted?

Of more direct interest to metalworking executives is his sudden espousal of the rights of big business. In connection with his blast on the unfairness of antitrust action by the government, he cited statistics that we believe have not been divulged previously. He says that in 1900 there were 21 business firms for every 1000 citizens. In 1949, he says, there were 26 firms per 1000 citizens. This is powerful ammunition against the leftist propaganda that the "bigs" are swallowing up the "smalls."

SET FOR CONTINGENCIES: Before passing final judgment on 1952 achievements, one cannot overlook the remarkable record that has been registered by the steelworks of the nation. At the beginning of 1952, steel ingot capacity was a bit short of 109 million net tons annually. As we approach the yearend, the nation's capacity is somewhere between 115 and 116 million net tons.

Production in 1952 will be approximately 93 million tons, and this in spite of a sizable loss of output caused by the steel strike. The American Iron and Steel Institute anticipates that steel ingot output in 1953 may total 119 million tons. Whether or not economic conditions permit this goal to be realized, the primary steel producing industry is well prepared to meet any reasonable challenge in 1953.

OPPORTUNITY BECKONS: Present-day experience indicates that it is almost impossible to exaggerate the opportunities that lie in efficient materials handling. They afford a quick and easy way to cut costs in many metalworking operations. A major reason for this is that from 33 to 40 cents of every production dollar (p. 53) is spent for picking up, transporting and putting down the materials and semi-finished goods processed by industry.

In view of this fact, it should not be surprising that people who know materials handling problems intimately stress the urgent need of more adequately trained materials handling engineers. Here is a field of great promise for those who venture into it at this opportune time.

AIR FREIGHT GROWING: In recent years the frequent need of expediting delivery of materials and parts has caused industry to rely more and more upon air transportation. The sales manager of a leading air freight company estimates that 50 per cent of his lines' business comes from metalworking and allied companies.

Air freight probably never will exceed a small fraction of the tonnage moved by surface transportation, yet its growth since 1944 has been phenomenal. About 250 million ton-miles will be recorded in 1952 (p. 46) and this is exclusive of 69 million ton-miles of air mail and air parcel post and 45 million ton-miles of air express. Lockheed Aircraft Corp. has issued a report entitled *Air Cargo Trends* in which it is estimated that air carriers will log a billion ton-miles annually sometime between 1958 and 1960.

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IN SETTING up a metal stamping contract, Firestone thoroughly analyzes the manufacturing procedure to reduce every controllable cost factor to the minimum. This includes the coordination and integration of new automatic stamping machines and heavy tonnage presses (like those shown here) with heat treating, welding, bonderizing, assembly and finishing. Modern, efficient assembly lines reduce handling and production costs and turn out your work ON SCHEDULE.

For a complete cost analysis on stainless steel, carbon steel or aluminum stampings and sub-assemblies write today to Firestone Steel Products Company, Metal Stampings Division, Akron 1, Ohio.

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Steel-Service Team

In there - - Pushing

Now more than ever the help of an experienced steel-service organization is especially valuable. That's why it may well pay to get in touch with the nearest Ryerson office or plant.

Not that we can *always* furnish the steel you need—much as we would like to, and hard as we try. But, with controls relaxing a little and a few steel products coming into better supply, there are more opportunities for experience and ingenuity to take over. And experience, ingenuity—and the will to help are never in short supply at Ryerson.

Your nearby Ryerson plant is staffed with specialists on carbon, alloy and stainless steels who are always ready to work with you. Often they can suggest practical alternates when the steel you need is not available. And back of the Ryerson plant nearest you stand the resources of fourteen other Ryerson plants, making up the nation's largest steel-service organization. So when a kind or size is not on hand locally, we may be able to ship it from another plant.

With all Ryerson plants cooperating, and with Ryerson specialists helping to make the most of available steel, we are usually able to maintain service in spite of the current situation. So we suggest that you check with us regularly for all your steel requirements . . . There is nothing too difficult when it comes to working with a Ryerson customer.

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PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Warehousemen Prepare for Buyers' Market . . .

WAREHOUSE steel salesmen wish they could be sure it's going to be a "happy new year."

Happy indeed have been the years since 1940. They witnessed a growth in the percentage of steel handled by warehouses from 14 per cent of the total produced annually to 20 per cent, saw the number of warehouses grow over 50 per cent and recorded an increase in the average warehouse steel order from 350 pounds to 1400 pounds.

Nostalgia?—But mid-1953 could mark the beginning of the end for the 2000 warehousers' golden era, though 1952 in some ways has been one of the kindest years of all. Steel mills lost 20 per cent of their production due to the steel strike, but warehousemen suffered only a 7 per cent decrease in the tonnage of steel supplied to them. Now the same steel production strength that sustained them so well in 1952 looms as a crushing force by the second half of 1953, say some warehousemen.

Ingot capacity will reach 120 million tons in 1953, and though production will be at capacity during the first half, many steelmen expect slackening second-half demand to cut total output for the year to around 105 million tons. Pessimistic warehousemen reason that their unusual health is predicated on willingness of buyers to pay premium prices for tight materials available from warehouse. As steel becomes more plentiful, warehouses could suffer as mills become amenable to orders they're snubbing today; and the mills' gain will be the warehousers' loss.

Optimism—But other warehousers look forward to the midyear easing in steel. They cite shortages in 60-65 per cent of the items they normally would stock and figure that as the variety of their inventories grows, so will their orders.

Also, they point out, the modern warehouse is able to provide delivery and service that the mills can't touch. When mills do accept lower-quantity orders, they won't be able to drop as far as they have in the past owing to higher-speed production, claim the optimists. Dispersal of warehouses helps make delivery a matter of hours rather than the days or weeks from mill, while cutting and slitting facilities increasingly common in even small warehouses make possible improved tailoring of sizes to customers' specifications. It all adds up to better business than ever, they say.

Poser — Most take a somewhat intermediate view. They see the loss of normal mill-volume customers, but also some increased business thanks to better inventories for their metal supermarkets which now generally handle aluminum, copper, stainless and specialties.

As steel output fills demand and competition begins to increase, warehousers look for a shake-out of the inefficient. But they don't expect it to be severe, nor do they expect business for the remaining firms to drop appreciably. Warehousing, they say, has always followed general business levels be-

cause it provides a needed service.

CMP—They're looking forward to the end of CMP, too, though they have fared better under CMP in the time of shortage than they could have without it. Now most feel the time and effort needed to keep up with the unmitigated paper work no longer are compensated by the benefits derived.

Strong demand is expected during the first and second quarters, but expect an end to CMP and a return to the buyers' market in force after midyear. But don't worry about the warehousers. With the growth in the number of small plants that depend on them and the improved service that today's warehouse is prepared to offer, the traditional warehouse service foundation seems solid.

Expansion Nears Completion

"I have yet to meet anyone who can present sound evidence that a recession of any measurable degree is visible in the foreseeable future."

With that comment, Avery C. Adams, president of Pittsburgh Steel Co., rounded out remarks on the company's "Program of Progress." The expansion program, in its final stages, will increase Pittsburgh's ingot capacity 48 per cent, finished steel product level 82 per cent and will add hot and cold-rolled sheet and strip to the company's product mix for the first time.

New facilities to be added in the expansion program include blast furnaces, two new turbo blowers, 12 150-ton open hearth furnaces enlarged to 250-ton furnaces, a new 66-inch-high blooming slabbing mill, five new blocks of soaking pits, a 66-inch continuous hot-rolled sheet mill and a 66-inch continuous 4-stand 4-high cold-rolled sheet mill.

By Jan. 1, 1953, Pittsburgh will have an annual ingot capacity of 1,392,000 tons.

Mr. Adams says Pittsburgh's net income during the first two months of the fourth quarter exceeded the same period of 1951 by 24 per cent. And, he concluded, "I believe 1953 will go down in history as a good business year, with a strong demand for steel products."

COMMERCE SECRETARY SAWYER
. . . blasts antitrust laws

Antitrust Reversal?

Commerce Secretary Sawyer praises a report calling for sanity in "trust-busting"

"WE NEED a new, modern definition of competition."

So says Commerce Secretary Charles Sawyer in commenting on a report by his department's Business Advisory Council on "Effective Competition."

Praise—The secretary describes the report as "one of the most constructive discussions of the subject of competition and the laws undertaking to govern it which has appeared in many years." He says he would "endorse in particular the suggestion recommending the establishment of a Conference Section in the Department of Justice where businessmen can go and get some guidance in advance of and perhaps in place of costly litigation." The secretary points out "it is interesting to note the figure in this report that fully 90 per cent of the cases arising in the antitrust field could be solved by preliminary conference."

Mr. Sawyer says that size alone should be no basis for antitrust action. "In 1900 there were approximately 21 business firms for each 1000 persons; in 1949—after all the gobbling up of the little firms was supposed to have taken place—there were 26 business firms per 1000 people." He asks: "If we attack size in business . . . shall we ignore it in . . . labor?"

Jungle—The secretary points out that within the years since the Sherman Act became law, there has "grown up a network—if not a jungle—of administrative rulings, conflicting laws, and judicial decisions which have made incredibly difficult the task of the businessman and his lawyer honestly trying to obey the law."

He says the report is neither a program nor a directive. It is calculated to stimulate thinking.

Gas Appliance Boom Is On

The gas appliance industry, which estimates a 1952 sales volume of over $1.2 billion, looks for an even brighter year in 1953. A trend in public, private and remodeled housing toward adoption of gas appliances seems likely to boost production and sales in the new year to an all-time high.

James F. Donnelly, president of the Gas Appliance Manufacturers Association, states that producers will probably go into 1953 at the late '52 pace, which will be considerably beyond the industry's rate of production at the outset of this year. A boom in late 1952 sales, plus the likelihood of improved materials allotments and general relief in Washington makes the 1953 outlook extremely bright. Remodeling of obsolete homes over to natural gas will be a major source of gas appliance business. Factory shipments of gas-fired furnaces and boilers will total 700,000 units this year, topping 1951 shipments by 85,000. First half 1952 gas conversion equipment is up 18 per cent over 1951, and 1952 third quarter conversion shipments increased 62 per cent.

First half shipments of gas ranges and water heaters were 20 per cent under the same 1951 period. But third quarter shipments of ranges rose 18 per cent and water heaters rose 33 per cent above the corresponding 1951 period.

Public demand for gas refrigerators centered on large capacity de luxe models, and indications are that this trend will continue in 1953.

Blueprint for America's Economic Future

as seen by National Planning Association
(in terms of 1951 dollars)

	1951	1960
Gross national product	$329,200,000,000	$425,600,000,000
Total labor force	65,800,000	72,300,000
Total private employment plus employment in business-type government enterprises	55,700,000	60,000,000
Investment in plant & equipment	$37,000,000,000	$41,000,000,000
Spending for construction of residential housing	$11,823,000,000	$11,600,000,000
Net foreign investment	$200,000,000	$2,500,000,000
Export surplus	$5,100,000,000	$5,000,000,000
Government purchases	$73,900,000,000	$76,500,000,000
Personal income before taxes (Index, 1951 = 100)	100	133

'Don't Be Afraid of Peace'

Not pretending to be the final answer, the National Planning Association's latest report shows the possibilities for an expanding and peaceful U. S. economy in 1960

THE U. S. DOES NOT need large defense expenditures in order to maintain a high employment economy. So says the National Planning Association in their report on "The American Economy in 1960: Economic Progress in a World of Tension".

H. Christian Sonne, chairman of the 18-year-old nonprofit, nonpolitical planning group, stressed the fact that "we need not be afraid of peace, if we can have it." He warned, however, that a prosperous economy with reduced defense spending will require a number of adjustments by government and private industry.

Puzzles To Solve—These include a reduction of taxes, both on individuals and on corporations; adoption of a relatively high rate of obsolescence in plant and houses and a general prevalence of one-shift operation; more foreign trade and capital export; an increase in non-defense government programs, particularly public investment and, the toughest one of all, private and public co-operation in efforts to bring price and wage levels in line with the needs of full employment purchasing power, economic stability and business expansion.

Gerhard Colm, chief economist, and Marilyn Young of the association worked out six different hypothetical patterns of a possible full employment economy for 1960, assuming a level of national security spending of $40 billion. Then, they made up an adjusted model which combined features of each of the six forerunners. The highlights of the adjusted model are shown in the table above.

Work-week Down—Other figures which were projected for 1960's full employment economy were an average work-week of 39 hours and output per man-hour of $3.24 (in 1951 prices). That, together with total civilian employment of 66.2 million, represents an increase of about 3 per cent per annum, the same average rate of increase in total production which has occurred from 1919 to date.

Chairman Sonne points out that "the study is not intended to present definite policy recommendations." But it is meant to indicate the possible approaches to a healthy and expanding and peaceful economy for 1960.

Plumbing Sees Good Year Ahead

The plumbing and heating industry was plagued by transition to a buyers' market, constantly changing needs of the defense effort, metal shortages and government restrictions during 1952. As a result, says Theodore E. Mueller, president of American Radiator & Standard Sanitary Corp., Pittsburgh, sales and profits declined from record 1951 levels.

For 1953, however, the present outlook for a sustained high level of building activity, coupled with generally lower inventories of manufactured products and an improved supply of materials look favorable for a return to higher levels.

Small Turbines—Big Backlog

Production and development orders for more than $4 million in the small gas turbine field are held by Solar Aircraft Co., San Diego, Calif. To fill orders on hand and meet anticipated future demand, the firm has completed a new turbine test building in San Diego, is building turbine manufacturing facilities and is establishing field service and spare parts programs.

Two small turbine units now being produced by Solar are the Mars turbine used to power a Navy shipboard fire fighting pump and generator sets, and the Jupiter turbine ordered by the Navy Bureau of Ships for use both in small boat propulsion and to drive electric generators on shipboard. Potential civilian uses of the units are being currently explored by the company.

Platinum Supply To Increase

Platinum will be easier to obtain next year. United States supply in 1953 is expected to be slightly above the 1952 figure, due largely to an estimated 20 to 25 per cent increase in imports from the Union of South Africa. Softening of world prices of platinum toward the price here also should help the supply situation.

National Production Authority figures indicate a steady climb in availability of refined platinum over the first three quarters of 1952, with third quarter supply totaling 51,345 troy ounces. The Bureau of Mines estimates world production of platinum-group metals in 1953 at 715,000 ounces, of which 100,000 ounces would be produced in the Soviet Union.

Quarterly export quotas have been reduced from 2000 troy ounces of platinum to 1250 ounces, exclusive of exports to Canada. Exports of primary forms of platinum to Canada during the first nine months of 1952 totaled 3694 ounces, or more than 50 per cent of this country's total exports during the period.

An American Airlines Convair Flagship receives its load as it prepares for flight. Freight carried in passenger planes provides a large part of airline revenue as...

Air Freight Flies High

As planes get bigger and delivery dates become more exacting, commercial airlines and private operators get a bigger chunk of metalworking's heavy cargo

"MR. JONES, by noon tomorrow, our Los Angeles assembly line will run out of door handles. We need another 4000 units or we'll be forced to shut down. What can you do for me?"

"We'll ship them by air from Cleveland. You can pick them up at the airport at 10 tomorrow morning, Mr. Smith."

Commonplace — Ten years ago that would have been a strange and highly improbable conversation, but today, thanks to air freight, it is commonplace.

Air freight, which got its start in 1944, will probably never replace surface transportation, but it points with pride to the 250 million ton-miles which will be logged this year. This is in addition to about 69 million ton-miles of air mail and air parcel post and over 45 million ton-miles of air express. And the future limits are literally sky high. Lockheed Aircraft Corp. last month released a report titled *Air Cargo Trends*, prepared by L. R. Hackney and C. J. Rausch, in which it estimated that commercial air carriers will log 1 billion ton-miles a year sometime between 1958 and 1960. Even that figure will represent only 0.3 per cent of the 1950 surface transport products which airline officials say are suitable for air cargo.

Who Uses It — But what are those products? With today's cargo capacities of up to 25,000 pounds, many heavy metalworking products are suitable for this type of material handling. G. W. Hawes Jr., district sales manager in Cleveland for American Airlines, estimates that about 50 per cent of his line's freight business is with metalworking and allied firms who ship everything from nuts and bolts to large components for military airplanes.

Air freight has several advantages for industry. Perhaps most important is time. In this day of expediting, lost time represents lost profits. Lower inventories and more precise delivery dates (STEEL, Dec. 8, p. 75) make airplanes handy tools in the hands of purchasing agents and sales managers. Airline officials reason that stockpiling takes up valuable time and space. "Why not put your inventory on wings?" they ask.

Beating the Rates—Air freighters also argue that rates aren't actually too high for the average businessman. There's a class for almost any size of shipment, as the table shows, each class having its own rate scale. Initial rates might be somewhat higher than motor or rail rates, but they figure that lighter packaging or even no packaging at all, less time between manufacture and assembly, savings in warehouse space and averted shutdowns that might result from longer shipping time more than make up for the higher initial cost. Besides, with the return to competition it is often the supplier who can deliver faster and on time who gets the contract.

To Get the Most From Air Shipping . . .

YOU CAN USE . . .	IF IT WEIGHS . .
Air Mail	Up to 8 oz
Air Parcel Post	8 oz-70 lbs
Air Express	1 lb up
Air Freight	50 lbs-16,000 lbs

But the flying boxcars have their problems, also. Equipment is one of the biggest. The military has hit the air shippers in two principal ways: Most of the airplane makers are doing defense work, and a large portion of the cargo-carrying equipment of the private airlines went to the Korean airlift and hasn't been returned yet. The situation may ease in 1953. Douglas Aircraft Co. Inc. has orders for about 25 DC 6-As, which can carry 25,000 pounds of freight. Consolidated Vultee Aircraft Corp. has on order over 100 Convair-Liner 340s for domestic and foreign lines.

Bulky Problem — Although the biggest planes can carry a large payload, bulky pieces are a problem, not only because of size but also weight distribution. And airplanes will probably never carry much loose material such as ore except of special types and limited quantity.

Another knotty problem for airmen is to educate business to the advantages of air freight. The Flying Tiger Line, Burbank, Calif., is engaged in an extensive advertising campaign in business magazines and papers in an effort to do this.

"Bush" Operators — One of the

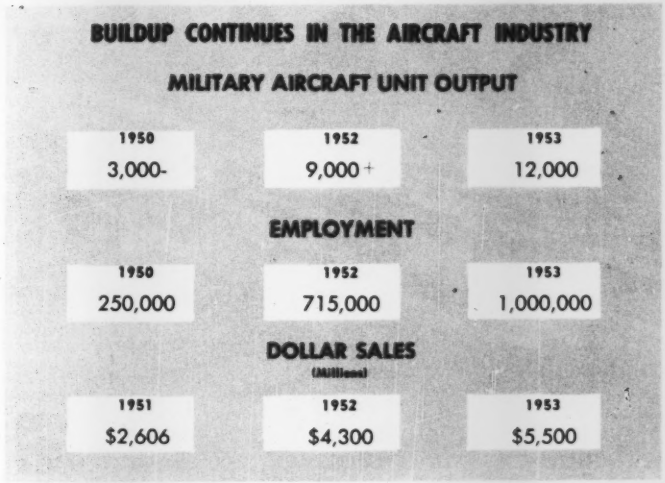
biggest problems of all for both airlines and shippers is getting the goods from the factory to an airport big enough to handle the sky giants. There are about 6000 airports in the nation, but only about 500 can handle commercial lines. That is where the small single and twin-engine planes operated by "bush" pilots come in. Generally speaking, there are two kinds of operations in this field: The chartered planes, which will pick up goods at any factory near a small landing field and deliver the goods to any destination within operational limits; and the "feeder" lines which run regularly scheduled service between outlying small fields and larger centralized airports.

The volume of business done by those local outfits is impossible to estimate, but it is considerable. For instance, W. R. Crow Inc., Toledo, made 243 charter flights in a little over the past year. L. E. Barnum, vice president, says that at least 80 per cent of the business from September through December was with metalworking firms such as Willys-Overland Motors Inc., Ford Motor Co. and Hudson Motor Car Co.

Feeding the Giants—The GCS Airlines operating out of Galion, O., is a good example of a feeder line. Galion is located in the heart of a large replacements parts industry for heavy roadbuilding equipment. The line makes scheduled trips to Cleveland Hopkins airport and routes shipments all over the world. William R. Fischer, co-operater of GCS, says that in the last six months of 1952, they hauled 135,559 pounds of freight and made 161 flights to Cleveland. If the weather closes in, they truck the load to Cleveland.

In one case, Mr. Fischer scheduled a replacement part for a large roadbuilding machine which had broken down in Belgian Congo, Africa. The part was in the machine four days after it left Galion, thus saving the contractor weeks of idle machine time which more than paid for the expense of air freight.

There are 70,253 miles of airways. If you have the right product with sufficient distribution range, it may well pay you to ship it by air—at least part of the time.



Aircraft Altimeter Shows Production Up

Unit output rose to about 1100 planes in December, 1952, and will stay constant next year. Airframe weight is due to rise as fewer trainers, more combat planes, are built

OUTPUT is still on its way up in the aircraft industry.

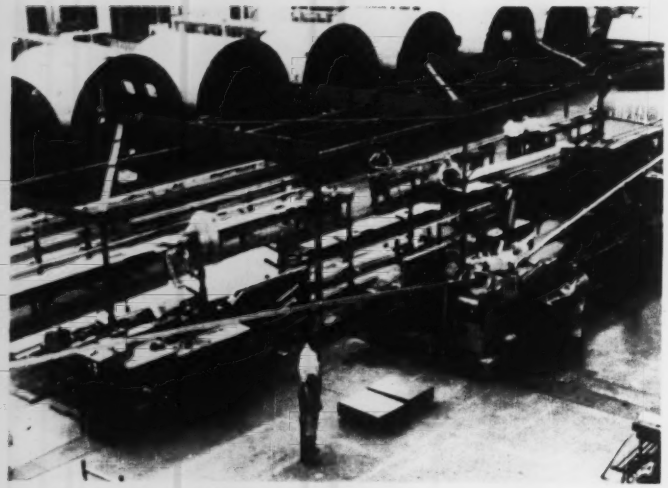
Unit production of airplanes reached a crescendo in December, 1952, with a monthly rate of 1000 to 1100 planes. Production, in terms of airframe weight will continue to increase into the third quarter, 1953, though the unit rate will remain constant at about 12,000 planes a year. That means a reduction in the output of trainers, liaison, and other relatively small planes and an increase in heavier combat planes.

Delayed Buck—Continued acceleration of activity in the aircraft industry results from long past appropriations and illustrates the long lead times in that field. The "stretchout" will not affect a reduction in appropriations for aircraft before fiscal 1954 and will not be translated into reduced production until 1955 or 1956. Appropriations for military aircraft in fiscal 1953 were again more than $14 billion, making the total ante for that purpose since Korea more than $40 billion. Of this only some $12 billion has been spent.

Even little of the fiscal 1952 appropriations have been used for aircraft delivered to date, leaving the unfilled backlog of orders for military planes about 20,000 units scheduled for delivery from 1953 to 1955.

Civvies Clip Along—While military aircraft represents 95 per cent of airplane manufacturing efforts (see the chart), commercial transports were turned out at a brisk clip, too—second highest rate in history, says Aircraft Industries Association of America Inc. Output totaled 400 units—240 two-engined executive-type planes and 160 36-passenger or larger types. Utility aircraft production jumped 33 per cent—2477 in 1951 and 3200 in 1952. Helicopter output, shrouded by military restrictions, was at an all-time high rate which increased constantly, month-by-month, during the year.

The reduction of aircraft procurement funds for fiscal 1954 is the first step in reprogramming aircraft production towards a maintenance level. Policy-making, long-range plans for that reprogramming will certainly be forthcoming in 1953.



Machine Shapes Wing Beam Caps

Super Constellation wing beam caps are shaped in this beam-bending machine developed by Lockheed Aircraft Corp., Burbank, Calif. Built by Hufford Machine Works Inc., Redondo Beach, Calif., following specifications of Lockheed engineers, it handles beams with over-all length of 60 feet or more. Heat, as much as 325 degrees Fahrenheit, is applied within the machine at the point of bend

Army Raises Sights on Ammunition Output

AMMUNITION makers won't face a stretchout of defense contracts. That conclusion is drawn from remarks on scheduled procurement by Maj. Gen. William O. Reeder, deputy assistant Army chief of staff.

Korean warfare is taking an ever increasing amount of ammunition — particularly artillery ammo. The battle line is being equipped with more guns daily. And new devices on weapons, says the general, are enabling soldiers to increase their rate of fire. So the Pentagon is raising its sights on ammunition production.

Well Supplied—Reported shortages in ammo stocks aren't as severe as rumors suggest, General Reeder says. "The over-all ammunition supply is ample, despite some specific shortages. On the whole, our troops are well supplied."

Reviewing post-Korea output, the general says that the U. S. was caught short on production facilities for ammunition. Vital machine tools were particularly hard to get. Consequently, output of ammunition since Korea still lags behind consumption in the battle field. The ammunition situation would have been very serious if it weren't for large World War II stocks.

Work Ahead — The ammunition industry will have order books filled, despite any turn the foreign situation may take. An armistice or lull in hostilities will have little or no immediate effect. The general says that even with a cease-fire it would take industry some time to raise the nation's depleted stocks of ammunition to levels adequate for new emergencies.

Cuyuna Manganese Probed

The problem of what to do about the immense reserves of manganiferrous ore on the Cuyuna Range is being tackled on a large scale by the Bureau of Mines. The aim is to extract the manganese, which runs all the way from 2 to 10 per cent in these deposits, on an economical basis.

Most of the work is to be done at a pilot plant just completed at the North Central Experiment Station at Minneapolis.

In an effort not to overlook anything, a lot of the ore has been shipped to the Boulder City, Nev., station where it will be subjected to the same treatment which now is being given to manganese ore from the Artillery Peak, Ariz., reserves. There a successful beneficiation process has been worked out but its cost must be reduced before it can be applied on a commercial scale.

Standardized Building Booms

The boom in standardized industrial construction will continue in 1953.

This is the opinion held by Herbert B. Luria, president, Luria Engineering Co., New York. A new production record was established in 1952 and even better sales are expected next year barring unforeseen changes.

Mr. Luria's forecast is based not only upon general industrial conditions that point to a continuation of high-level activity but also upon the volume of business placed with his company for the first quarter of 1953.

"We have entered the present winter with the customary seasonal slump totally eliminated," he said. "For the first time since we started to produce standardized buildings, our plant at Bethlehem, Pa., will operate at 100 per cent capacity throughout the winter months."

He noted a strong trend toward larger and heavier structures made with standardized steel frames and a sharply increased acceptance of permanent standardized construction by blue-chip industrial concerns.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Shells, 60 mm	Lehigh Foundries Inc., Easton, Pa.
Shells	U. S. Hoffman Machinery Corp., New York
Fin Assemblies	Saginaw Industries Co., Saginaw, Mich.
Trucks	General Motors Corp., Detroit
Automotive Parts	International Harvester Co., Chicago
Materials Handling Equipment Parts	John W. Hobbs Corp., Springfield, Ill.
Aircraft Parts	Beech Aircraft Corp., Wichita, Kans.
Aircraft Kits	Thomas A. Edison Inc., W. Orange, N. J.
Radio Receivers	Crosley Div., Avco Mfg. Corp., New York
Generator Sets, Diesel	Stewart & Stevenson Services, Houston

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administration Services Division, Temporary E Bldg., Washington 25.

Materials Orders

TIN—Amendment 3 of NPA Order M-1, effective Dec. 24, 1952, decontrols secondary tin mill products. It also eliminates the necessity of reporting shipments of armored castings on NPA Form 141. Producers should report only to the Army Department.

COPPER—Amendment 1 of NPA Order M-16, effective Dec. 22, 1952, eliminates the requirements that brokers report copper and copper scrap inventories, purchases and sales on a monthly basis. Excluded from this amendment are brokers whose end-of-month inventory or monthly purchases or sales averaged 60,000 pounds or more during the first six months of 1952.

Price Regulations

MACHINERY — Interpretation 36 of CPR 22 and Interpretation 23 of CPR 30, both issued Dec. 17, 1952, state that in computing the net cost of a manufacturing material, increases in cost resulting from dislocations in the source of supply of the material arising from NPA allocations, or from any other cause constituting a departure from a manufacturer's normal buying practices, cannot be used as a basis for determining the materials cost adjustment other than under the sections relating to the use of conversion steel.

ALLOY STEEL—Amendment 4 of Revision 1 of Supplementary Regulation 100 of General Ceiling Price Regulation, issued Dec. 19, 1952, and effective Dec. 24, makes it clear that producers of metal alloys containing small percentages of iron or steel are not entitled to ceiling price increases granted under Revision 1 of Supplementary Regulation 100 of GCPR.

BRASS, COPPER—Producers of brass mill and copper wire mill products will not be required to recalculate ceiling price adjustments covering costs of foreign copper before Apr. 1, 1953.

GLASS—Supplementary Regulation 40 of CPR 22, issued Dec. 19, 1952, and effective Dec. 23, authorizes an industry earnings standard increase of 2 per cent in ceiling prices for manufacturers of rolled figured, heat absorbing and wire glass.

MALLEABLE IRON CASTINGS — Supplementary Regulation 1 of CPR 60, issued and effective Dec. 19, 1952, authorizes an industry earnings standard increase of 6.2 per cent in ceiling prices for producers of malleable iron castings.

Appointments in Washington

John O'Nan, on loan from the Duquesne Light Co., Pittsburgh, was appointed chief of the Major Equipment Scheduling Branch of the Defense Electric Power Administration.

Harold M. Stockton, of the Dallas Power & Light Co., Dallas, was named chief of the Projects & Materials Control Branch, Defense Electric Power Administration.

Emmett A. Vaughey, an independent oil operator from Jackson, Miss., was appointed deputy director of the Production Division, Petroleum Administration for Defense.

William L. Cressman, on leave from Armco Steel Corp., Middletown, O., will become director of the Iron & Steel Division of the National Production Authority effective Jan. 1. Mr. Cressman, who is now deputy director, will replace John E. Timberlake of Jones & Laughlin Steel Corp., Pittsburgh.

Report from Westinghouse

Westinghouse Electric Corp. since 1946 has invested $245 million in new plants and facilities, which by 1955 will amount to $450 million and which will increase productive capacity 125 per cent. During 1952 product output amounted to more than $1.4 billion, the greatest volume in the company's 66-year history.

Westinghouse President Gwilym A. Price states that the company's most difficult problems during the year were: Rising costs of materials and labor without compensating increases in prices of products; shortages of critical materials as steel, copper and aluminum; and higher taxes.

He says 1953 business outlook appears good and order backlogs high. Although the consumer is not expected to spend recklessly in the new year and probably will show greater interest in savings, products such as home appliances will be bought at the highest rate in history.

Allot More First Quarter Steel

DPA announces that an additional 550,000 tons of carbon sheet and strip steel will be allotted in the first quarter for distribution in claimant areas.

The allotments are based on a survey of steel producers which indicated that sufficient first quarter open space exists in steel mills producing carbon sheet and strip steel to permit issuance of additional tickets.

Of the allotments, motor vehicles will receive 353,000 tons; consumer durable goods, 100,000 tons; building materials, 40,000 tons; and general industrial equipment, 15,000 tons.

Kyes Gets Defense Post

Industry will have another voice in the inner circles of the new administration when it takes over the reins of government Jan. 20. Roger M. Kyes, vice president of General Motors Corp., will be deputy secretary of defense in charge of procurement. He will serve under his old GM boss, C. E. Wilson, new Secretary of Defense

Expand Nicaro Nickel Plant

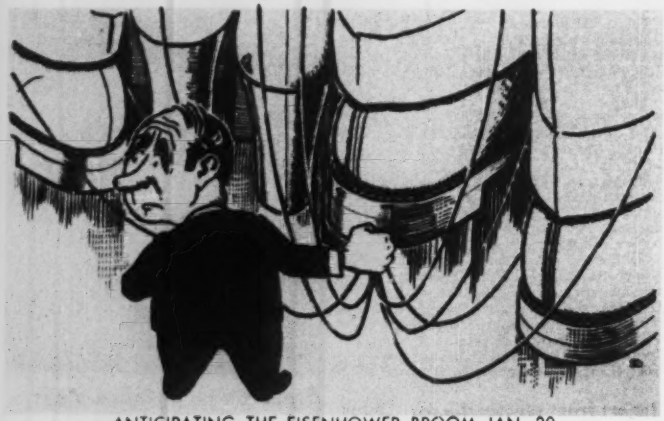
General Services Administration, in a new nickel campaign, will begin work immediately to increase by 75 per cent the output of the Nicaro nickel plant in Cuba.

The Nicaro plant, operated by the Nickel Processing Co., is producing at the rate of approximately 30 million pounds of nickel per year, contained in nickel oxide powder. At completion of the expansion program, capacity will be 52.5 million pounds per year.

DMPA at the request of DPA is seeking to interest several private companies, including Bethlehem Steel Co., in expanding Cuban facilities and in developing new methods of utilizing the nickel in the Cuban ore.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*



ANTICIPATING THE EISENHOWER BROOM JAN. 20
. . . 2500 supervisors of 2.6 million federal employees

Agency initiative is at a standstill in Washington as many of the 2500 appointive bosses await replacement. It will be the biggest housecleaning in the nation's history

IT'S a small tail that wags a big dog in Washington.

Whereas civilian employees on the federal payroll number about 2,566,400 names (of which 245,000 are in Washington), the top, appointive bosses number only about 2500. The latter include the cabinet members and all the policy-making executives who tell the Civil Service workers what to do.

End of the Tail—Most of the 2500 present bosses expect to be replaced; in fact, many of them already have quit their jobs and many others have written or will write their resignations. It will be the first real housecleaning since F. D. Roosevelt moved into Washington with his New Deal in 1933, and, because of the great growth in the federal government personnel, the biggest housecleaning in history.

With this big replacement program just ahead, conditions are just about what you would expect in Washington. The wheels of government started to falter the morning after election and the normally-ever-present initiative withered.

Standstill—Now initiative is at a standstill—as witness the decision of ODM Director Fowler to hold everything in the defense agencies in status quo until the Eisenhower administration takes over. Federal employees generally are carrying on their bare statutory duties, but all feel that it is the end of an era. Real activity will not again be generated until the new regime takes hold Jan. 20.

What will happen then? What new policies will be put into effect? In a state of suspense in direct ratio to their positions with reference to the top echelons, federal executives and employees await the fatal words.

Money Abroad? See Guides . . .

First of a new series of "Investment Guides" to be issued by the Office of International Trade is to deal with Venezuela. It is due for publication early next year.

The pamphlets are aimed at encouraging investment of private American capital to industrialize and otherwise stimulate economic activity in Point Four countries. They will describe the laws and policies of the different countries in regard to treatment of foreign investors. In particular they will reveal the hazards often encountered and how they may be minimized or overcome.

Housing Research Listed . . .

More than 1000 housing research projects under way in the United States are listed in a 723-page book prepared by the Building Research Advisory Board, National Academy of Sciences, under a contract with the Housing and Home Finance Agency. Many of them are of interest to the metal industries—as one that seeks the development of plastics to replace metal in domestic piping.

Entitled "A Survey of Housing Research," copies of the book are available at $3 from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Navy Procurement Rules . . .

"Navy Procurement Regulations," incorporating all current procurement rules and regulations, has been issued in a single volume, in loose-leaf form to facilitate quarterly revision. Included in the 27 chapters are the treatments of such subjects as contract clauses, financing, negotiation, small business and taxes. Copies may be obtained at $3 from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Research and Renegotiation . . .

Under an amendment to the renegotiation regulations, research and development expenses are allowed as long as they promote execution of a defense contract or enable a contractor to bid or negotiate for future defense business. Even such expenses in previous years are allowable in certain instances.

Details may be had from the Renegotiation Board, Washington, or its regional offices, or from the *Federal Register* of Dec. 3.

McKAY

WALKER BROTHERS, of CONSHOHOCKEN, PA., have earned their reputation as manufacturers of quality conduit and electrical raceway tubing through years of serving the electrical industry. To maintain this position, it requires constant and rigid inspection—an alertness to new methods and the use of quality equipment.

McKAY is proud to have had their tube mills selected by WALKER. Experience gained after producing millions of feet of conduit on McKay tube mills, has proven conclusively that they can rely on McKay equipment to maintain their high standard of quality and keep pace with the ever increasing volume demanded by industry.

If your product is tubing it will pay you to investigate McKay equipment for greater yield—higher quality product — lower maintenance — and less down time.

The McKay RS-525-150 KVA Electric Weld Tube Mill with McKay Rotary Saw Cutoff

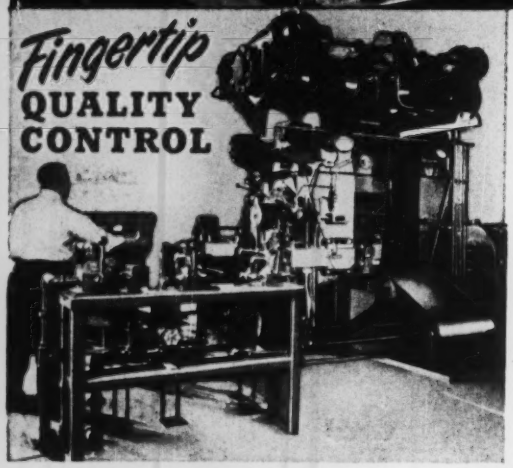
ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUS

The McKAY MACHINE *Company*

YOUNGSTOWN, OHIO

ASSOCIATED WITH WEAN ENGINEERING CO., I

Complete Steel Service* from One Source



This completely modern plant with latest type equipment for *rolling* strip and processing sheet and strip steel is your ideal source for:

* Warehouse stocks in sheets, plates, coils, cut lengths . . . All tempers and finishes.
* Steel strip in coils and cut lengths . . . restricted tolerances, all tempers and finishes.
* Roller leveling, pickling, annealing, shearing, slitting and skin rolling.

PRODUCTION STEEL STRIP CORPORATION supplements our regular warehouse service with custom steel at mill prices. This new, 4-high, reversing type cold strip mill with its modern, electronically operated *fingertip* quality control affords unusual flexibility in supplying steel strip to your exact specifications. Thickness .025 to .125 in all tempers and either bright or satin finish, can be processed to your exact width in coil or cut lengths.

PRODUCTION STEEL

WAREHOUSES:

PRODUCTION STEEL COMPANY
20001 Sherwood Ave., Detroit 34, Mich.
Phone TWinbrook 3-5000

PRODUCTION STEEL STRIP CORP.
20001 Sherwood Ave., Detroit 34, Mich.
Phone TWinbrook 3-5000

PRODUCTION STEEL COIL, INC.
20001 Sherwood Ave., Detroit 34, Mich.
Phone TWinbrook 3-5000

PRODUCTION STEEL CO. OF ILLINOIS
2801 Roosevelt Rd., Broadview, Ill. (Chicago)
Phone MAnsfield 6-4242

SENECA STEEL SERVICE, INC.
1050 Military Rd., Buffalo 17, N. Y.
Phone Riverside 7820

SALES OFFICES:

PRODUCTION STEEL COMPANY
1002 E. 81st Street, Indianapolis, Ind.
Phone Broadway 3468
E. W. Richardson, Sales Representative

PRODUCTION STEEL COMPANY
548 W. Mechanic Street, Jackson, Mich.
Phone 2-9097
Glenn Christman, Sales Representative

PRODUCTION STEEL CO. OF ILLINOIS
5226 N. Bay Ridge Ave., Milwaukee, Wisc.
Phone WOodruff 2-1206
H. Clive Morrison, Sales Representative

SENECA STEEL SERVICE, INC.
739 Westchester Ave., Rochester, N. Y.
Phone Culver 7480
W. J. Knoll, Sales Representative

SENECA STEEL SERVICE, INC.
1347 Northcliffe Rd., Syracuse, N. Y.
Phone 73-5722
Dean Hethington, Sales Representative

SENECA STEEL SERVICE, INC.
347 Price Street, Jamestown, N. Y.
Phone 5759
S. N. Olmsted, Jr., Sales Representative

PRODUCTION STEEL COMPANY
1040 High View Lane, Green Bay, Wisc.
Phone Howard 7407
Tony Canadeo, Sales Representative

Materials Handlers Lift Sales

They sold about $1250 million worth of equipment in 1952 and see the need for their machinery steadily rising because it can help cut costs

MAKERS OF materials handling equipment did about $1250 million worth of business in 1952—equalling the 1951 record—and they hope to do as well or better in 1953.

The Basis—They're so optimistic because the gross national product (value of all services and goods produced) may hit $350 billion in 1953, compared with $344 billion in 1952. From 33 to 40 cents of every production dollar being spent today is merely for picking up, transporting and putting down the materials and semi-finished goods processed by the nation's industrial plants.

The opportunities for reducing manufacturing costs through better methods of handling are still enormous, materials handling people believe—if enough adequately trained young material handling engineers can be found. That last problem is serious. L. West Shea of Union Metal Mfg. Co., Canton, O., and president of Material Handling Institute, comments: "The need for better trained material handling engineers mounts high into the thousands, and it is doubted if there are 500 material handling supervisors today who could qualify as being well informed material handling engineers."

Education — Among the steps taken by the industry to build up a new supervisory force has been joint action between the material handling equipment makers (through the institute) and the professional material handling engineers (through the American Material Handling Society) to form a College-Industry Committee on Material Handling Education.

The new organization has enlisted the top educators in the field and has given over control of the program to college and university men in industrial engineering education. Dr. Spencer A. Larsen of Wayne University, Detroit, is chairman of the committee.

Already the institute has developed and begun distribution of four manuals interpreting handling.

Unification — Another trend in the industry, claims the institute, is an increasing spirit of "oneness" among manufacturers of different classes of equipment for material handling. An officer of the conveyor group believes that "the areas of competition between various branches of our industry are grossly exaggerated." The institute's president-elect, Howard Palmer of Lewis-Shepard Products Inc., Watertown, Mass., says that "the basic reason that manufacturers of different classes of equipment are now more interested in working out their problems jointly is that each has learned the rule of good application for his product. Unity is not wholly a question of principle, but is the result of education and the realization that fringe applications make fringe business."

HOWARD M. PALMER
. . . heads material handlers

Practical demonstrations of the inter-relation of the industry will be seen next May 18 in Philadelphia when the Fifth National Materials Handling Exposition begins. Some 234 exhibiting companies will be on hand.

The House Trailer: $284-Million Business

THE HOUSE trailer has taken a permanent place in our housing facilities and has a very promising future.

Some 1,850,000 Americans now are domiciled in some 12,000 trailer parks which, if grouped together, would form the nation's sixth largest city—between Detroit and Baltimore. Some 740,000 trailers are in use today and the trailer population is increasing at the rate of 175,000 a year.

Big Business — Those statistics have been collected by Housing & Home Finance Agency with the cooperation of the trailer industry. That industry consists of more than 150 companies. The industry's sales in 1930, when the trailer was a vacation luxury or a dwelling for swank vagabonds, were $1.3 million; estimate for 1952 sales is $284 million, with standard models selling at all the way from $2500 to $6000.

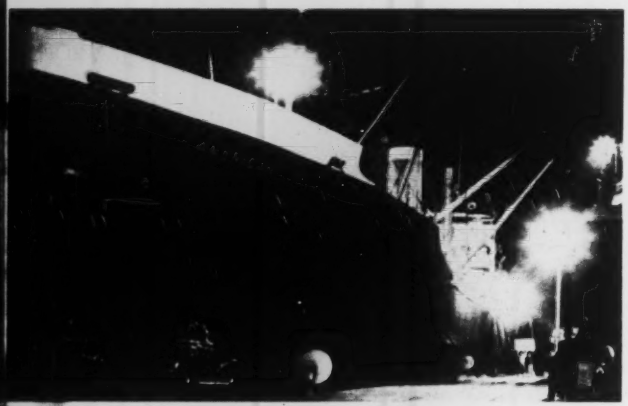
War and defense housing needs, of course, gave the trailer its big boost; 68 per cent of today's trailer sales are to defense workers. About 35 per cent of the trailers are sold to workers in mobile occupations who move their homes when they go from one job to another. Over 90 per cent of the trailers in use today come under the head of "housing." With rental space in trailer parks ranging from $15 to $25 a month, the trailer resident enjoys a cost-of-living advantage which tends to make the trailer all the more popular.

Federal Aid—Congress gave its blessing to the trailer when it wrote a general increase in excise taxes into the 1951 tax bill; in that act Congress removed the 7 per cent excise tax which previously had applied to trailer sales.

"Where emergency housing is needed—and needed quickly—the modern trailer coach is the answer," says the HHFA. It has just put out a booklet on "Recommended Standards for Trailer Courts."

WESTERN EUROPE

. . . seeks new markets for its growing metalworking production



EUROPEAN EXPORTS ARRIVE AT A U. S. DOCK
. . . metalworking product are main dollar-makers

The U. S. is among the prime targets for West European countries looking for bigger export markets. Sentiment here is growing in favor of taking more of their products

WESTERN EUROPE will make an allout drive to expand its metalworking exports in 1953. That will require breaking old trade patterns and forming some new ones.

The exports drive will be an effort to utilize added steel output and metal fabricating production developed since World War II. About 67,780,000 tons of steel were poured in Europe during 1952, 38 per cent more than the 1944 total output.

One Way Out — For the short term, defense programs will be sufficient to absorb any possible surplus of steel. But, beyond the short term, only more and better export markets can assure European countries of using 67 million tons plus of steel a year.

The U. S. and Canada are prime targets for more exports. The U. S. can absorb increased foreign imports without severe damage to domestic industry. For example, if the British reached their goal of exporting 10 per cent of the total British machine tool output to the U. S. market, it would amount to about $1 million in sales, compared with $303 million in domestic machine tool shipments in 1950.

Some Have It—There are other export markets for Europe. South America, a pre-World War II market, is being actively cultivated again. Brazil, the number one prospect, has slowed down her buying recently and is trying to balance payments. Venezuela, rich in oil and iron ore, is well heeled with dollars to buy what she wants. Colombia and Argentina are fertile export markets for most metalworking products and only political difficulties have held sales down.

European sellers are approaching Near and Far East countries with agricultural equipment, road-building equipment, electric power generating equipment and general purpose machinery.

More Materials—What happened in Western Europe during 1952 which caused this terrific head of pressure for increased exports? Most important, the effects of the post-Korean boom wore off. Shortage of basic raw materials in Europe was, on the whole, less acute than in the previous two years. The coal and coke position improved; American coal is still being imported but at a diminishing rate. Iron ore problems were partly solved by developments in ore preparation. The scrap shortage remains one of the toughest nuts to crack. Great Britain especially felt the restriction of low scrap supplies. Even here, though, the

STEEL's series on the economic past, present and future of the major Western European countries is concluded here with a summary of the general situation. The series was prepared by STEEL's European staff headed by Vincent Delport. J. A. Horton gathered material for the article on Great Britain and Herbert Gross prepared the German summary which both appeared on Dec. 22. The Dec. 15 articles were prepared by Leon Jaudoin for France and Jacques Foulon for Belgium. Erick Hook made the anclysis of Sweden and Dr. Mario d'Onofrio the analysis of Italy in the Dec. 8 issue. Complete iron and steel statistics for all industrial nations of the world will be carried in the 1953 Metalworking Yearbook issue Jan. 5.

situation improved—British scrap consumption for steelmaking was about 9,850,000 tons in 1952; imports dropped to 720,000 tons in 1952 from 2,110,000 tons in 1950.

High water marks of defense expenditures, short of an allout war, have been passed. Western Germany's and Japan's metalworking industries have made quick recoveries from World War II losses. Finally, as Secretary of Commerce Charles Sawyer said in his report of the economic survey of Europe to the President: "It was clearly recognized in every country that this so-called buyers' market is developing throughout Western Europe. There, as in our own country, people are becoming more conscious of price as well as quality."

Offshore Buying — Defense aid from the U. S. helped alleviate the difficulties of the North Atlantic Treaty Organization nations, which are now participating in the 1952 offshore procurement program. Bulk of the $730 million in offshore buying is for ammunition and explosives, followed in dollar volume by ships and harbor equipment, aircraft and engineering equipment.

France benefits by almost half of the total 1952 offshore disbursements with nearly $350 million; Italy follows with $140 million, the United Kingdom comes third with $75 million. Other countries benefiting by more than $30 million each are Belgium, the Netherlands and Switzerland.

Truth and Consequences — But, as the Sawyer report also points out: "Indefinite dependence on aid destroys self-respect, impairs the real strength of the recipient economy and has a capacity to destroy friendly relations between the giver and the recipient. Because that line of thinking is growing popular, the new administration in Washington was expected to trim foreign aid budgets, and European leaders themselves favor 'Trade, Not Aid.'"

The most far reaching event of the past year in Western Europe was, of course, the activation of the European Coal & Steel Community at Luxemburg on Aug. 10. Purpose of the Schuman Plan is to establish, in the course of time, a common market for coal and steel, covering the territories of the six member countries (Belgium, France, Italy, Luxemburg, Netherlands and West Germany). That would involve the removal of any existing customs duties and the removal of other protective measures at present used in individual countries.

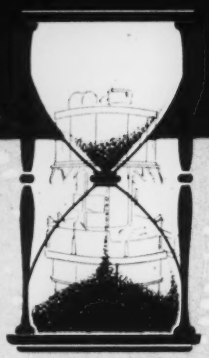
Target Time—The bureaucracy of the Schuman plan has already begun to form and so has a drift from economic considerations to political ones. It's no wonder. Almost insurmountable problems face the high authority of the plan—what to do about differences in wage levels, purchasing power, social charges, costs of raw materials and other production costs among the member nations of the common market. Undeterred by these difficulties, the high authority has already marked February, 1953, as the time when the common market for coal will be established.

What has often been left unsaid is that the Schuman coal-steel pool, if and when it becomes a workable organization, will form a potent competitor in world markets. Again from the Sawyer European report: "Europe cannot function on a strong, stable and self-supporting basis unless it can compete with the U. S. and other countries in its own home market, in the North American market and in third areas where dollars could be earned if European manufactured goods could be supplied on a competitive basis."

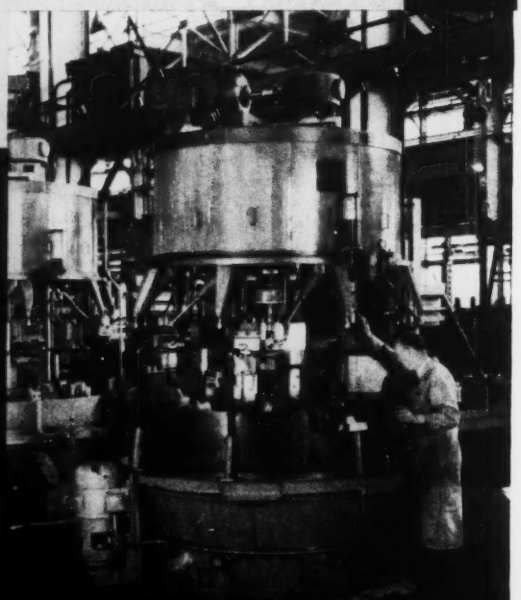
The Test—Europe's metalworking industries have recovered fully from World War II devastations. American money aid and technical assistance has helped increase productivity some. This last year saw the end of raw materials shortages which had held back production of iron and steel. Next year will be the testing period for many of those European metalworking industries. The test will be: Can they match American productivity? They'll get this much help. The new American administration will probably lower tariffs and simplify customs procedures.

STEEL PLANT IN SAARBRUCKEN, SAARLAND
. . . output there has helped France keep balance with Germany

Sands of Time



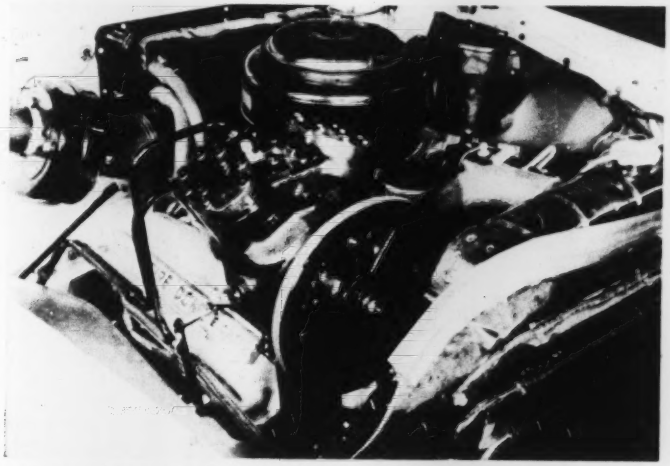
As the Hour glass accounted for the passing of time the Bullard Mult-Au-Matics have, in many plants, established manufacturing time schedules with an attendant record for time savings.



Whatever the pace, there is always manufacturing economy and efficiency in the Mult-Au-Matic Method.

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom



Air-Conditioning Unit is New in DeSotos

This belt-driven four cylinder compressor, mounted on the right side of a DeSoto Fire Dome V-8 engine, powers Chrysler Corp.'s automobile air conditioning system. Engineers say the compressor's cooling ability is equal to melting three tons of ice in a single day. A product of Chrysler's Airtemp Division, the air conditioning is now being installed in DeSoto and Chrysler closed cars

Auto prospects look good, or do they? Closer examination of the manpower and materials situations reveals some short-term problems

DETROIT

A DUAL threat to the high output of automobiles and trucks which industry officials are confidently predicting for next year cannot be ignored. Materials and manpower are going to be harder to find than customers for at least the first three months of 1953.

Braced—The fact that next year will be one of intense sales effort by every company is no question. And in many cases this "hard" sell is beginning before it is actually required. Reception of most of the new models has been "good" to "terrific." One or two makes have not caught the public's fancy in the way their producers had intended them to, and selling at discount has become necessary. But those are the exceptions, and it appears a safe bet to predict that yet-to-be announced new models, if the press and supplier reaction is a fair guide, will enjoy a tremendous public acclaim when they are available.

Most makers will be trying to skim the cream off their market before the initial public enthusiasm begins to wane, and that is where the difficulty will come from materials and manpower shortages. To those observers who keep close tabs on the steel situation and finger the labor pulse frequently, one conclusion becomes inescapable: The automotive industry is to have some of its greatest production problems in the months immediately ahead.

Matter of Manpower—The labor shortage has become increasingly obvious since the steel strike as the automotive industry worked desperately to make up the units it lost. The latest report of the Michigan Employment Security Commission fails because of the necessary time lag to show exactly how much overtime is currently being worked and how wide the gap is between the number of people employed by the auto industry and the desired number.

But it gives some clear indications to the situation. During July Michigan motor vehicle producers and equipment makers had work-weeks of 35.1 hours. In August the work-week had risen to 37.6 hours as steel began to flow. In September the work-week had been extended to 42.1 hours. The final quarter's work-week length can only be guessed at and has been adversely affected on an industry-wide basis by model change-overs but most of the companies which are now working on 1953 models have been programming six-day operations, and longer than normal shifts if a second or third trick could not be manned. The overtime plans were frequently disrupted by failure of materials to keep pace with scheduled consumption.

Record Peak — Michigan's employment, at mid-October, was at a record high or 9000 more than the previous peak registered two years ago and was climbing as fast as new people could be coaxed into the work force. Of 26,000 people added to manufacturing plant payrolls between mid-September and mid-October 16,000 of them found their checks signed by motor vehicle and parts makers. Since that time the automakers and their parts suppliers have been attempting to find 19,000 additional people, and corollary industries such as fabricated metals plants have been seeking 8000 more for employment.

Manufacturers in four Michigan cities—Detroit, Flint, Battle Creek and Grand Rapids—have the most acute situations. In Detroit where immigration is again rivalling its wartime importance, employment is within an ace of the alltime high at 1.3 million. Unemployment reached a new low of only 25,000. Even the distressed Iron Mountain

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area in the upper peninsula has a brightening outlook as another occupant moves into the vacated Ford facilities.

Key Material—Steel, however, is at least as much a key to next quarter's car and truck output as manpower, and it cannot be coaxed into the auto plants from hiring stands on populous street corners and enticing newspaper ads.

The government's decision to write tickets for second quarter steel enough to permit the industry to produce 1,250,000 cars and 315,000 trucks plus the authority to turn out another 250,000 cars if automakers can find the metal has caused some people to think that all motordom's troubles are over.

Over Optimistic?—For the long term the materials situation is straightening out for auto builders. But they still must solve steel scarcities for the next three months.

A help will be the bonus steel allotment for the first quarter. Auto assemblers will be able to turn out an additional 135,000 cars in January, February and March as a result of getting an additional 353,000 tons of a total 550,000 extra allocation.

Not Enough—The industry now has enough steel for about 1 million cars in the first quarter. It wrangled enough copper and aluminum to manufacture 1,150,000 units in the first quarter and is authorized to build 1,250,000 cars. It has no chance of achieving the ultimate ceiling, and now the odds are against reaching 1,150,000.

Hot and cold rolled sheets are under intense demand, chrome stainless strip which is more widely used in the new models than it has ever been is under severe pressure, so too are bars of almost all description, although the emphasis is greatest on hot-topped material. Some steel sources are urging the automakers to use semi-killed steel wherever possible so that the military shell program which requires the fully killed material will not stymie them so thoroughly. Warehouse demand also (see p. 53) reflects the extent of the need of many auto parts makers for more steel than they can get from mills. Detroit warehouses note that quantities being bought by many customers are above minimum mill orders and could logically be expected to be placed on mills if there were any room in the mills' books.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,691	658,918
March	517,207	792,550
April	576,505	680,281
May	546,673	695,898
June	560,947	653,682
July	246,461	522,858
August	293,722	571,442
September	592,253	505,758
October	654,341	558,971
November	556,366	480,323
December		402,729
Total		7,179,161
Week Ended	1952	1951
Nov. 22	129,224	80,489
Nov. 29	119,781	119,962
Dec. 6	129,005	116,932
Dec. 13	121,590	115,627
Dec. 20	136,819	107,186
Dec. 27	72,000*	39,488

Association, Ward's Automotive Reports. *Preliminary.
Sources: Automotive Manufacturers

Conversion Surprise—Conversion steel demand, which had been expected to peter out by this time because of the cautious way in which automakers approached such purchases immediately after the strike, is exceedingly high for first quarter. Yet the sources of such material have been blotted up to a large degree by more balanced production facilities in the steel industry and by long-term deals made by other large consuming industries. There is not the relief expected from conversion or from foreign steel which some governmental sources have believed might materialize.

Motordom's famed ingenuity at working itself out of materials problems is in for a severe workout over the next three months.

Ford Gets Bigger J-57 Order

Ford's disclosure that its J-57 turbo-jet engine contract has been supplemented by an additional $20 million indicates that this Pratt and Whitney engine is one of the long-range "white hopes" of the Air Force. Used in a B-52 bomber, this engine also is slated to power "other aircraft which have not been announced to the public," Ford vice-president John Dykstra, revealed.

Initial deliveries of the high-thrust engine begin a year from next February from the former Dodge-Chicago plant which Ford engine division has been using for Wasp Major reciprocating engine production. Peak production on the piston engine will come next year before the fade-out begins. The J-57 order now totals $97 million.

Explaining what will be needed in the way of tools for J-57 production, Mr. Dykstra said that about 400 of the machine tools needed for Wasp-Major production will be converted for use in the J-57 pilot line and that an additional 200 machine tools are on order for Ford's use and another 250 for placement in suppliers' plants. Experimental forging, foundry, and titanium operations for J-57 parts have been going on since October, he revealed. Fewer problems with machine tools deliveries are expected than were encountered in the Wasp-Major engine tool up, Mr. Dykstra said, because of the higher priority given to the J-57 and because of the expanded capacity of the machine tool industry. The overlap of Wasp-Major and J-57 production is expected to be accomplished without interruption to employment.

Motordom Murmurs

Shell molding is being considered as the manufacturing process for the cam shaft for Chevrolet's V-8 engine. This new power plant is not expected before 1955 models. . . Costs have balked Packard's plan to bring out a Pan American sports type convertible. Instead a new custom convertible—the Caribbean, price tagged at $5,200—will be introduced shortly featuring wire wheels, rear mounted spare tire and chrome trim outlining the wheel opening. The car is the first in Packard's ultra luxury line for the "carriage trade" . . . Changes and new designs are anticipated for power steering units. One new unit will reportedly operate by purely mechanical means, taking its power from the fan belt. Another, now in use, is being completely redesigned, using aluminum die castings and fan castings for several parts now cast in iron.

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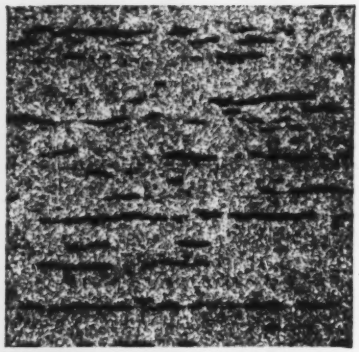
TESTS PROVE GRAPH-MO® BEST STEEL FOR GAGES!

Reports from users show Graph-Mo steel outwears other tool steel 3 to 1!

Graph-Mo* steel is today's big news for gage users and gage makers. The difference between Graph-Mo steel and other gage steels is so real you can see it—in the form of tiny, scattered, parallel marks barely visible on the surface of a polished piece of Graph-Mo. It's the "graphitic look"!

These marks indicate the presence of free graphite in the steel's structure. And this free graphite, together with diamond-hard carbides, enables Graph-Mo to outwear other tool steels an average of 3 to 1 according to reports from dozens of gage users. Tests prove Graph-Mo is also the most stable gage steel ever made. (see below).

Photomicrograph at right shows the free graphite and diamond-hard carbides that give Graph-Mo unusual wear resistance. They minimize scuffing, pick up and galling, and resist abrasion. Graph-Mo machines 30% faster than other tool steels, gives uniform response to heat treatment, and is available *now!*



100X

12-year stability test proves Graph-Mo steel master gage stays within 10 millionths of its original dimension

Here's proof of Graph-Mo's outstanding stability. These measurements were taken on a typical Graph-Mo steel master plug gage over a 12-year period. They show only 10 millionths of an inch change after that time.

1940—1.73996 *1941*—1.73995 *1942*—1.73998 *1943*—1.73997
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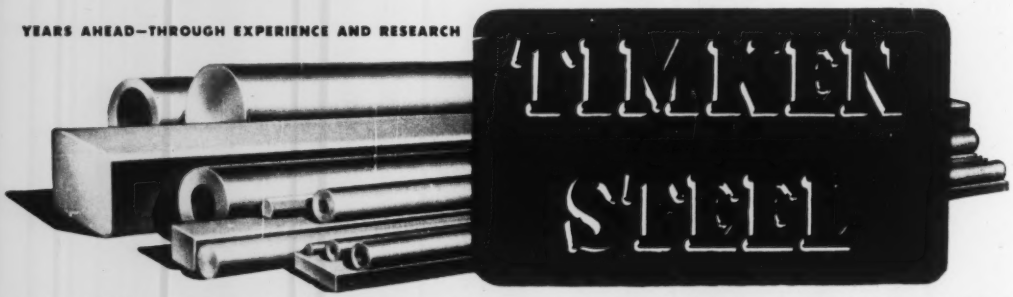
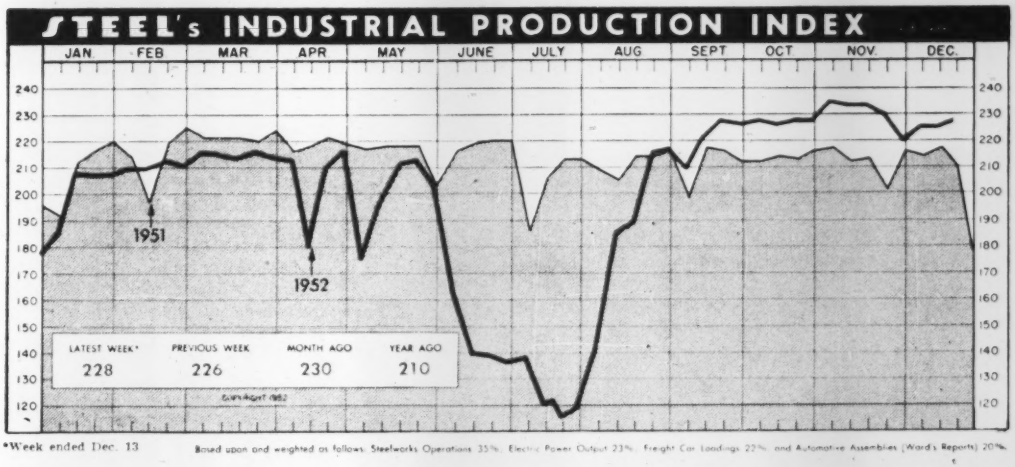
You can always tell Graph-Mo by its "graphitic look". This built-in "trade-mark", the result of the free graphite in its structure, can't be duplicated in other steels. Look for it, next time you buy gages. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Dec. 13 Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automotive Assemblies (Ward's Reports) 20%.

Industry is expected to quickly regain production lost over the holidays. Many metalworking companies plan high output in the first quarter

INDUSTRY is expected to start 1953 at high-for-the-season momentum.

Production machinery, of course, is running in low-gear during these holiday weeks. Yet the nation's output is remaining 5 per cent over the same weeks in 1951. Industrial activity this week will probably drop to the lowest level for the holiday season. Here are estimates on how far prime indicators are declining.

How Far Down—Only 75 per cent of the normal amount of freight cars are being loaded, sealed and sent on their way. Electricity production is around 82 per cent of pre-holiday generation as many industrial plants close. Automotive companies are slicing their output considerably, but not down to the usual 35 per cent of mid-December weeks. Passenger car manufacturers are determined to make December a whirlwind finish to 1952. Steel production probably hit its low-point last week by declining to around 83 per cent of rated capacity. A week earlier, furnaces poured steel at a rate of 105.5 per cent.

Output To Surge—Quick snapbacks will probably occur for most industries during the first half of January. Defense needs and rising consumer demand are instilling optimism in most manufacturers' forecasts for 1953. Metalworking companies, in particular, are planning to boost their output during the first quarter.

Index Declines—With Christmas just around the corner, industrial activity in the week ended Dec. 20 made a last-minute spurt. STEEL's industrial production index that week edged up 2 points to 226 per cent of the 1936-1939 average. Steel auto-truck and electricity production still were high on Dec. 20, but automotive and freight car loadings had already started their seasonal decline.

Electrical Goods Decline . . .

The electrical appliance industry is running at a fast clip. But high production in the fall and winter months aren't bringing industry totals for 1952 anywhere near 1952. The National Electrical Manufacturers Association says that factory sales of household refrigerators in October rose 21 per cent over October 1951. But refrigerator sales in 1952 fell 19 per cent under a year earlier by Nov. 1. The ten-month total for ranges isn't impressive, either. Shipments of electric ranges in 1952 by Nov. 1 stood 29 per cent under the same months in 1951. Indication that this percentage gulf may widen further is that October production fell 40 per cent under October, a year earlier.

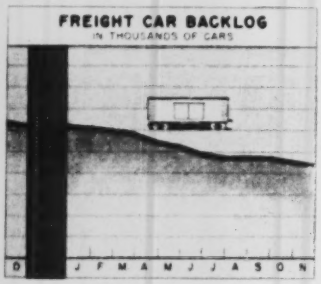
Industry sales of electric storage water heaters in October climbed 5 per cent over the same 1951 month, but the 1952 total fell 22 per cent under water heaters sold in the first ten months of 1951.

Outlook for electrical and other appliances is reviewed in STEEL (Dec. 22, p. 38).

Manpower Supply Tightens . . .

Labor shortages, now plaguing many industries, may become a nationwide migraine in early 1953. This threat to production is seen in employment figures released by the Bureau of Labor Statistics. Local manpower shortages in November rose 2.2 per cent from October and were 18 per cent greater than in August, when the steel strike forced lay-offs throughout the metalworking industry.

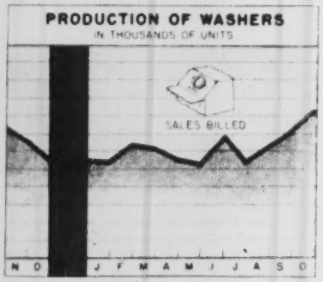
Behind the tight labor market lies increased defense output and the uptrend in civilian manufactures. Manufacturing employment



Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1952	1951	1952	1951
Jan.	5,338	26,356	120,251	144,758
Feb.	7,358	15,947	118,960	154,861
Mar.	5,619	11,271	113,854	158,619
Apr.	397	6,628	108,270	155,871
May	2,502	4,919	103,910	150,628
June	3,264	6,703	99,615	147,725
July	1,536	2,417	93,265	144,810
Aug.	-4,558	1,528	95,761	139,014
Sept.	2,628	9,657	98,377	140,135
Oct.	1,423	3,468	90,708	132,792
Nov.	2,878	6,752	87,607	129,158
Dec.		3,309		123,947
Total		96,190		

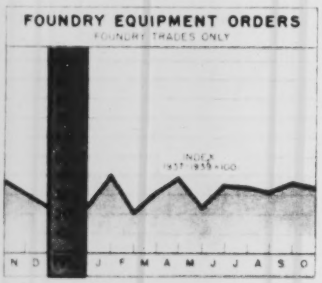
* End of month.
American Railway Car Institute



Household Washers
Sales Billed—Units

	1952	1951	1950
Jan.	213,088	321,092	272,576
Feb.	240,481	341,328	342,967
Mar.	241,431	368,455	423,802
Apr.	217,211	292,103	333,072
May	213,668	253,942	304,640
June	274,437	253,119	325,217
July	292,503	193,779	292,261
Aug.	264,537	239,081	351,452
Sept.	273,732	313,756	424,043
Oct.	327,814	297,210	439,924
Nov.		262,454	370,964
Dec.		218,664	377,013
Totals		3,301,123	4,289,931

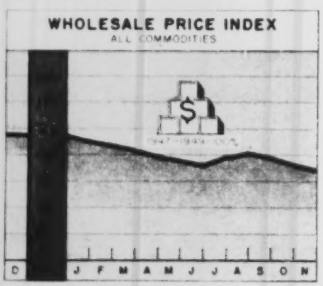
American Home Laundry Mfrs. Assn.



Foundry Equipment Orders

	Index 1947-1949=100		Value Thousands	
	1952	1951	1952	1951
Jan.	404.5	668.0	$1,862	$3,075
Feb.	200.4	658.6	922	2,940
Mar.	310.0	599.0	1,427	2,758
Apr.	385.1	490.1	1,773	2,256
May	225.2	431.7	1,037	1,987
June	353.8	393.2	1,629	1,810
July	243.6	396.3	1,383	1,797
Aug.	311.6	404.5	1,434	1,862
Sept.	365.9	346.5	1,685	1,595
Oct.	335.8	372.1	1,538	1,714
Nov.		305.5		1,406
Dec.		230.5		1,061

Foundry Equipment Mfrs. Assn.



Wholesale Price Index
(1947-1949=100)

	1952	1951	1950
Jan.	113.0	115.0	97.7
Feb.	112.6	116.5	98.3
Mar.	112.3	116.5	98.5
Apr.	111.8	116.3	98.5
May	111.6	115.9	99.6
June	111.3	115.1	100.2
July	111.8	114.2	103.0
Aug.	112.2	113.7	105.2
Sept.	111.7	113.4	107.1
Oct.	111.1	113.7	107.7
Nov.	110.7	113.6	109.3
Dec.		113.5	112.1

U. S. Bureau of Labor Statistics

Charts Copyright 1952 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Nov. 24	Indus. Production	Dec. 22	Ranges, Gas	Dec. 1
Durable goods	Sept. 22	Ironers	Dec. 22	Refrigerators	Dec. 8
Employ., Metalwkg.	Oct. 27	Machine Tools	Dec. 15	Steel Castings	Nov. 3
Employ., Steel	Dec. 15	Malleable Castings	Nov. 3	Steel Forgings	Oct. 20
Fab. Struc. Steel	Dec. 22	Pumps	Dec. 8	Steel Shipments	Nov. 3
Furnaces, Indus.	Nov. 24	Prices, Consumer	Dec. 1	Vacuum Cleaners	Dec. 22
Gear Sales	Dec. 15	Radio, TV	Dec. 15	Wages, Metalwkg.	Nov. 17
Gray Iron Castings	Nov. 3	Ranges, Elec.	Dec. 8	Water Heaters	Dec. 8

in the year ended Dec. 1 rose 1 million to 47.9 workers. Metalworking companies, in particular, were increasing their work forces. The bureau reports that the nation's producers of primary metals increased their employment 2.9 per cent to 1,375,000 workers. Makers of fabricated metal products had 1,051,000 employees on their payrolls, or 6.8 per cent more workers than on Dec. 1, 1951. The transportation industry—which includes aircraft companies—raised their employment 11.4 per cent to 1,729,000 workers. Companies making electrical machinery raised work forces 9.9 per cent to 1050 employees.

Significantly, the companies making nonelectrical machinery have decreased their work forces over the year. On Dec. 1, employment in this industry had declined 1.2 per cent to 1,607,000 workers. The shortage of steel is probably the main factor in this employment reduction.

Water Heaters Edge Down . . .

Production of gas water heaters in 1952 followed the same pattern of electrical appliances. The Gas Appliance Manufacturers Association reports that industry shipments of automatic gas water heaters in November rose 18 per cent above the same month in 1951. But shipments of water heaters in 1952 by Dec. 1 were 3.9 per cent under the same months in the previous year.

Railroad Outlays Drop . . .

The Interstate Commerce Commission says that the nation's class one railroads are planning to spend $301.4 million in the first quarter on road and equipment. This expenditure total is 12.6 per cent under the first quarter of 1952. Equipment spending is expected to drop 19 per cent and road outlays will fall 11 per cent under the first three months in 1951.

New Companies Increase . . .

New companies are arising on the business scene faster than in 1951. Stock corporations chartered in October totaled 8234 new firms, compared with 7529 concerns in October, 1951, says Dun

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	105.5	105.0	104.5
Electric Power Distributed (million kwhr)	8,300[1]	8,140	7,824
Bituminous Coal Output (daily av.—1000 tons)	1,658	1,672	1,919
Petroleum Production (daily av.—1000 bbl)	6,540[1]	6,562	6,206
Construction Volume (ENR—millions)	$167.3	$241.0	$139.0
Automobile, Truck Output (Ward's—units)	136,819	121,590	107,186
TRADE			
Freight Car Loadings (unit—1000 cars)	640[1]	721	672
Business Failures (Dun & Bradstreet, number)	120[1]	157[1]	117
Currency in Circulation (millions)[3]	$30,487	$30,370	$29,263
Dept. Store Sales (changes from year ago)[3]	+1%[1]	+1%[1]	+2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,360[1]	$16,849	$20,265
Federal Gross Debt (billions)	$267.0	$267.2	$259.4
Bond Volume, NYSE (millions)	$20.7	$19.9	$15.3
Stocks Sales, NYSE (thousands of shares)	9,540	9,625	7,061
Loans and Investments (billions)[4]	$78.4	$78.3	$73.8
United States Gov't. Obligations Held (billions)[4]	$32.8	$32.9	$32.1
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	213.2	213.2	234.9
All Commodities[7]	109.3	109.6	113.6
All Commodities Other Than Farm and Foods[7]	112.8	112.8	116.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,027,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

& Bradstreet Inc. By Nov. 1, new incorporations rose 10 per cent above the same months in 1951 to 77,815 enterprises. At present rate of incorporations, new companies in 1952 may equal or surpass the 92,925 companies founded in 1950. Postwar peak in new business occurred in 1947, when 112,638 new firms were started.

Fewer Firms Fail . . .

The number of companies being forced to close their doors is down, but the liabilities are up. Business failures in 1952 totaled 7028 companies by Dec. 1, or 6 per cent under the first 11 months of 1951, says Dun & Bradstreet Inc. Liabilities, on the other hand, rose 8 per cent in the same period to $259.9 million.

Living Costs Inch Up . . .

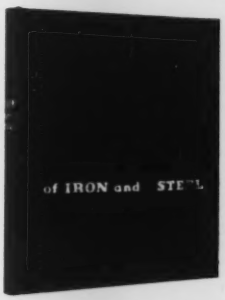
The cost of living, after dipping slightly in the early fall, returned in November to the record level attained in August. The Bureau of Labor Statistics says that consumer prices in November crept up 0.6 of a percentage point to 191.1 per cent of the 1935-1939 average.

The statistics bureau reports that the 0.1 per cent rise was too small to prevent a 1-cent per hour pay cut for 1,250,000 railroad workers. The railroad escalator contracts are adjusted quarterly, the last adjustment for the three months ended Sept. 1.

Trends Fore and Aft . . .

Debts by individual persons in the past six years rose 100 per cent to $125 billion, according to the National Association of Credit Men . . . Production of steel forgings in September rose 8 per cent over the same month in 1951 . . . Real estate boards say they don't expect building costs of homes to decline in 1953 . . . Petroleum production in 1952 is estimated at 2.6 billion barrels, an alltime peak . . . Construction expenditures in 1952 are expected to reach $1329 million, or $16 million over 1951 . . . Sales of the gas utility industry in the year ended Nov. 1 increased 9.4 per cent over the year ended Nov. 1, 1951 . . . Freight car loadings in the week ended Dec. 13 fell 4 per cent below the corresponding week in 1951 . . . Bituminous coal production in the week ended Dec. 13 averaged 1.6 million tons daily, compared with 1.9 million tons mined daily in the comparable week, 1951 . . . Sales of vacuum cleaners in November rose 16 per cent over sales in November, 1951.

This book was written by men you know and respect as "tops" in steelmaking . . .



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SPEED NUTS eliminate 50% of the parts formerly required—*making a 23% savings in time and materials, with extra savings in materials-handling all along the line!*

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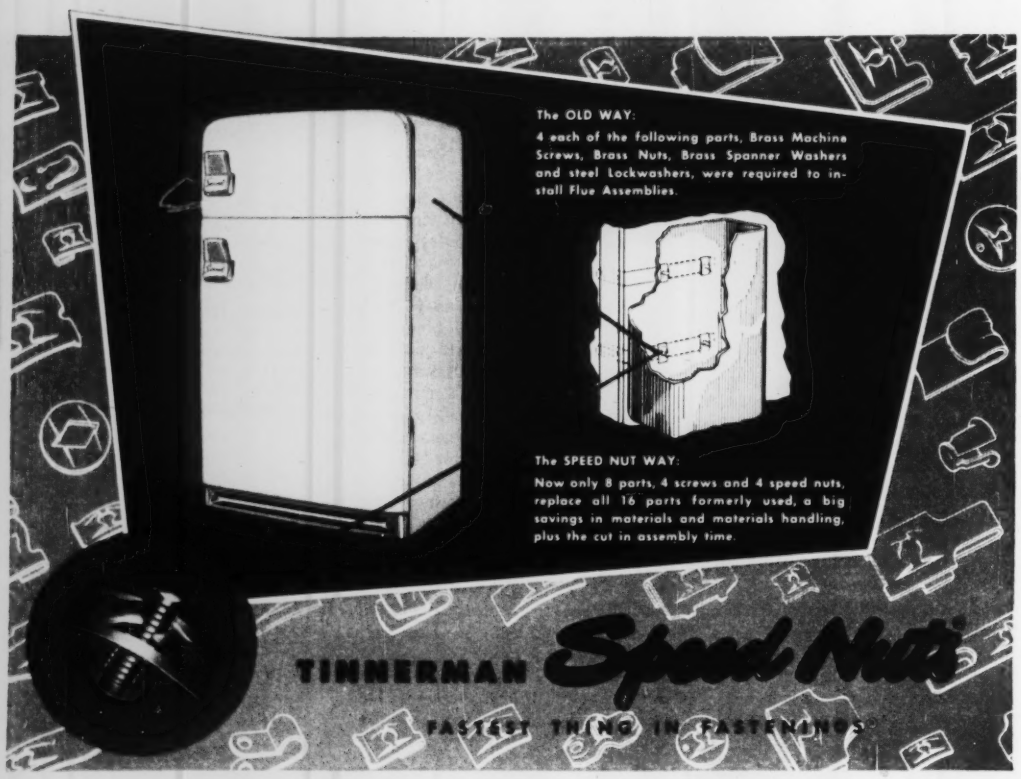
In Canada: Dominion Fasteners Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S.A., 7 rue Henri Barbusse, Levallois (Seine).


The OLD WAY:
4 each of the following parts, Brass Machine Screws, Brass Nuts, Brass Spanner Washers and steel Lockwashers, were required to install Flue Assemblies.
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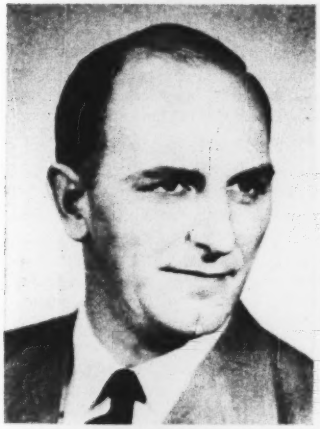
Now only 8 parts, 4 screws and 4 speed nuts, replace all 16 parts formerly used, a big savings in materials and materials handling, plus the cut in assembly time.
TINNERMAN Speed Nuts
FASTEST THING IN FASTENINGS

Men of Industry



LEO J. PANTAS
. . . gen. mgr. of new Yale & Towne div.

W. C. KENNEDY
. . . Industrial Lubricants gen. sales mgr.

THOMAS R. HAZEL
. . . heads Hyster design standards

Leo J. Pantas, general manager of the Stamford, Conn., division of **Yale & Towne Mfg. Co.,** New York, was advanced to general manager of the new Yale lock and hardware division which unifies under one management the manufacture and sales, in the United States, of the company's plants producing brand locks and hardware at Stamford, Salem, Va., and two new plants now under construction at Gallatin, Tenn., and Lenoir City, Tenn.

Glenn E. Seidel was elected a vice president, **Minneapolis - Honeywell Regulator Co.,** Minneapolis, in charge of engineering in the Minneapolis plants. A member of Honeywell's engineering organization since 1943, Mr. Seidel has been director of the company's ordnance division for the last year and a half.

Paul E. Parks, vice president and general manager, was elected a director of **Industrial Forge & Steel Inc.,** Canton, O., subsidiary of Barium Steel Corp.

Victor Tanski was appointed general manager, **Replac Corp.,** Cleveland. He has been manager of the plastics division at Ionia Mfg. Co., Ionia, Mich., and prior to that was plastics manager at M.P.M. Inc., Cleveland.

W. C. Kennedy was appointed general sales manager, and **Hubert E. Evans** was appointed chief chemist of **Industrial Lubricants Co. Inc.,** Detroit.

G. A. Shoemaker was advanced from vice president to the office of executive vice president of **Pittsburgh Consolidation Coal Co.,** Pittsburgh. **S. M. Cassidy** becomes a vice president of the parent company with headquarters in Pittsburgh, and continues to serve in his former capacity as president of the Consolidation Coal Co. Division (Ky.).

Dallas Amburn was named assistant to the sales manager for industrial resins, Plaskon Division, **Libbey-Owens-Ford Glass Co.,** Toledo, O. He goes to Plaskon from Ford Motor Co., where he was manager of manufacturing engineering, concentrating on shell molding process and equipment.

Hudson Motor Car Co., Detroit, appointed **James Ellis** to the production staff, Airframe Division.

Gerald E. Smart was placed in charge of plant engineering department at the Norwood, O., Works of **Allis-Chalmers Mfg. Co.,** where, since January, 1951, he has been a plant engineer.

Thomas R. Hazel was appointed head of the standards division, design engineering department, at **Hyster Co.,** Portland, Oreg. He has been six years in the engineering department, tractor equipment division.

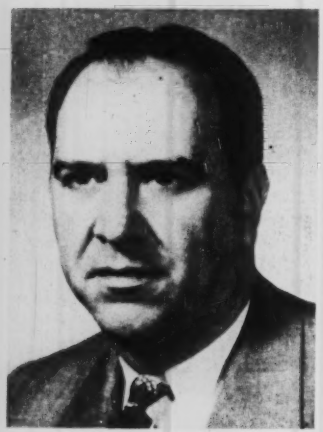
A. J. Hafendorfer was appointed vice president in change of the steel buildings division of **Chicago Vitreous Enamel Product Co.,** Cicero, Ill. He has held various sales, production and executive posts in the company since becoming associated with it in 1937.

Edmund Q. Sylvester, vice president and a director of **Griffin Wheel** Co., Chicago, was elected executive vice president.

Thomas A. Stratford was appointed manager, advertising and public relations, for **American Welding & Mfg. Co.,** Warren, O. He succeeds to the post recently vacated by **Don W. Dawson** when the latter was made manager of sales of American Welding's building products division. Mr. Stratford joined American Welding last June following seven years with the lamp division of General Electric Co.

Alvin R. Almquist was named divisional comptroller by **Tube Reducing Corp.,** Wallington N. J. He

FRANK A. DEPATIE
. . . Parker Appliance rubber sales mgr.



E. L. CARLOTTA
. . . heads a Parker Appliance operation

has been with Mack Trucks Inc. since 1946.

M. A. Hanna Co., Cleveland, announces that **George M. Humphrey** has resigned as chairman of the board and as a director. Mr. Humphrey was designated as Secretary of the Treasury by President-elect Eisenhower. **George H. Love**, vice chairman of the Hanna board, becomes chairman. Mr. Humphrey also resigned as chairman of the board and a director of the subsidiary, Hanna Coal & Ore Corp., which named **Joseph H. Thompson** chairman, and **Gilbert W. Humphrey** president. He also became a director of M. A. Hanna.

John C. Malajan joined the Detroit sales office of **Udylite Corp.** as sales engineer for the Michigan area.

Frank A. Depatie succeeds **E. L. Carlotta** as manager of rubber sales at Parker Appliance Co., Cleveland. Mr. Carlotta, who has headed rubber sales for Parker since early 1950, was made manager of all rubber research and development for the company.

Charles A. Frawley joined the sales staff of **Northwest Chemical Co.**, Detroit, to service accounts in northern Ohio.

Imperial Belting Co., Chicago, appointed **Fred G. Metz** as sales engineer to cover Michigan and northern Wisconsin. His headquarters will be at Detroit.

Barton Tyler was appointed executive assistant to J. Grant Macdonnell, administrative head of Weapon Division, **Northrop Aircraft Inc.**, Hawthorne, Calif.

Hartzell C. Mills was named Minnesota representative for **Pittsburgh Lectrodryer Corp.** His offices are at 1954 University Ave., St. Paul.

Fine Organics Inc., New York, announces entry into the marine chemical field with appointment of **Capt. George W. Mikkelson** as director of its marine chemical department.

A. D. Hammond and **J. W. Frazier** were elected to the board of directors of **Graybar Electric Co.**, New York. Mr. Hammond is district manager at Atlanta; Mr. Frazier at Kansas City.

George B. Howell was named manager of manufacturing for **General Electric Co.'s** welding department at Fitchburg, Mass. Formerly superintendent of manufacturing for the department, Mr. Howell now succeeds **Thomas Sproule** who has joined the General Electric manufacturing services division.

L. M. Williams, J. S. Chisholm, T. O. Robertson and **A. R. Walker** were appointed factory branch managers, reporting to the general manager of **General Motors Corp.'s** Electro-Motive Division, La Grange, Ill. Other appointments at Electro-Motive include: **George W. Elsey**, appointed to the newly created position of manufacturing assistant to the general manager; **J. E. Hacker**, works manager; and **E. A. Wondracheck**, manufacturing manager, Plant No. 1.

James M. Hait, vice president in charge of engineering at **Food Machinery & Chemical Corp.**, San Jose, Calif., was elected to the board of directors and executive committee.

Harold R. Hungerford was appointed administrative sales manager in charge of accounting and tabulating equipment, **Remington Rand Inc.**, New York. He succeeds **Henry W. Millang**, who was transferred to Newark, N. J., as branch manager in that area. Mr. Hungerford has been with Remington Rand for 25 years and prior to his present assignment was branch manager at Philadelphia, St. Louis, San Francisco and Portland, Oreg.

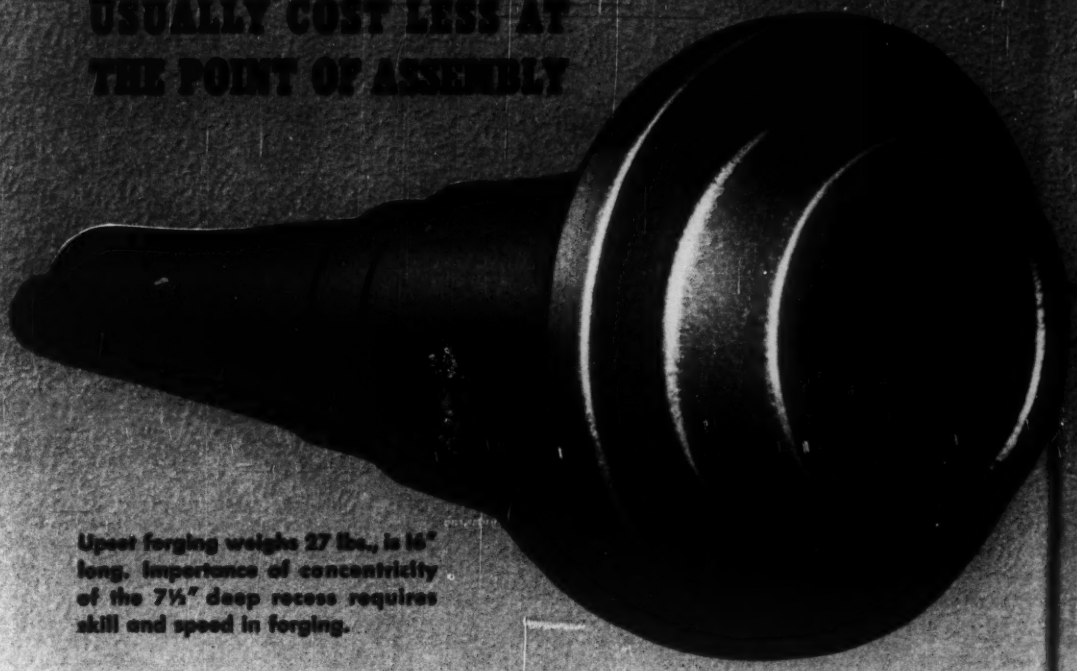
Named to the newly created post of sales manager-cars at the **Dodge Division**, Chrysler Corp., Detroit, is **L. F. Desmond**, formerly director of advertising and merchandising. Named sales manager-trucks is **William S. Woolsey**, formerly director of truck sales.

William G. Wells was promoted to works manager of the Harris Division at Cleveland of **Harris-Seybold Co.** He has been superintendent since 1940. **Walter F. Knebusch** resigned as director of manufacturing to join F. E. Meyers & Bros., Ashland, O., as vice president-

WILLIAM G. WELLS
. . . Harris-Seybold div. works manager

TRANSUE FORGINGS

USUALLY COST LESS AT THE POINT OF ASSEMBLY



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OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

ROBERT C. MYERS
U. S. Steel market developer

F. P. STRIETER
. . . Dow Chemical appointment

JOHN V. BOARDMAN
Claymont works mgr. at CF&I

manufacturing. Mr. Wells will be responsible for all manufacturing operations of the Harris plant.

Robert C. Myers was appointed director of market development of **United States Steel Co.**, Pittsburgh. He succeeds **Robert J. Ritchey**, who is leaving to accept a position with another company. When U. S. Steel Co. was formed in 1951, Mr. Myers was made assistant director of market development.

F. P. Strieter, former chief of the casting section of **Dow Chemical Co.'s** metallurgical laboratories, was named assistant superintendent of the die casting department.

Edward G. Brierty and **Raymond E. Warner** were appointed sales representatives for the midwest sales region, Electronic Tube Division, **Westinghouse Electric Corp.**, Elmira, N. Y. Headquarters will be in Chicago.

John V. Boardman was appointed works manager of the Claymont, Del., plant of **Colorado Fuel & Iron Corp.** to succeed **W. P. Worth**, resigned. **Fordyce Coburn** was made district manager in charge of operations for the E. & G. Brooke, Claymont and Buffalo plants of CF&I. He continues to serve as general plant manager of the Brooke plant and as vice president of Richard Ore Co. His headquarters will be at Birdsboro, Pa.

OBITUARIES...

Jervis B. Webb, 62, founder of **Jervis B. Webb Co.** and **Huron Forge and Machine Co.**, Detroit, died December 21.

Charles G. Atkin, 64, president, **Osborn Engineering Co.** and Barber Gas Burner Co., Cleveland, died Dec. 5.

Charles M. Gearing, 79, former works manager of the New Departure Division of **General Motors Corp.**, died Dec. 14 at his home, Meriden, Conn.

Alex U. Steenrod, 62, steel building products sales manager for **Berger Mfg. Division**, Republic Steel Corp., Canton, O., died Dec. 10 in Columbus, O. He joined Berger in 1944. Prior to that Mr. Steenrod was associated with Milcor Steel Co. in Canton and Chicago.

Joseph C. Rovensky, 66, chairman of **Patino Mines & Enterprises Consolidated Inc.**, New York, died Dec. 17. He was vice chairman of Morris Plan Corp. of America and president of Patican Co. Ltd.

Frank L. Estep, 76, consulting engineer, **Barium Steel Corp.**, New York, died Dec. 11.

Charles S. Swett, 73, former vice president and director, **Swett Iron Works**, Medina, N. Y., died Dec. 14.

Harry W. Butterworth Jr., 62, chairman of the board of **H. W. Butterworth & Sons Co.**, Philadelphia, died Dec. 17. He retired as president last March.

Raimund T. Guernsey, 75, former manager of **Thomas Iron Works**, Philadelphia, died Dec. 17.

Edwin E. Littler, 80, retired purchasing agent of **Anaconda Copper Mining Co.**, New York, died Dec. 14.

Willard H. Rother, 67, an authority on gray iron, died Dec. 12 in Toledo, O., where he had lived since retiring in 1951. Mr. Rother had been associated for 41 years with **Buffalo Foundry & Machine Co.**, which later became Buflovak Equipment Division, Blaw-Knox Co., and which he served as chief metallurgist.

Kent S. Clow, 64, president, **James B. Clow & Sons**, Chicago, died Dec. 14.

Paul Boland, 36, plant superintendent of the brass foundry of **Central Brass & Aluminum Co.**, Cincinnati, died recently.

Joseph P. Wright, for the last 17 years executive vice president, **Western Foundry Co.**, Chicago, died Dec. 16 at his home in Oak Park, Ill.

Thomas M. Hutchison, 75, president, **Drummond-McCall Iron & Steel Co.**, Montreal, died recently.

John M. MacAdam, 73, retired executive of **American Pipe & Construction Co.**, South Gate, Calif., died Dec. 9. He retired in 1947.

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...cut *your* core making costs!

Simplifies Production. With this Osborn core blower, the operator has only to insert the core box into the machine. The machine then does the rest . . . automatically blows the core and ejects the box. While one core is being blown, the operator is free to remove the core from the other box.

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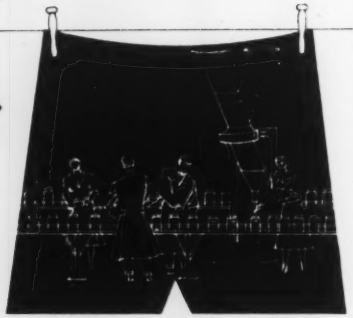

PACKAGING AND PROCESSING ROOMS in food, drug and candy plants are kept at uniform humidities with Alcoa Activated Alumina, to maintain production regardless of the weather.

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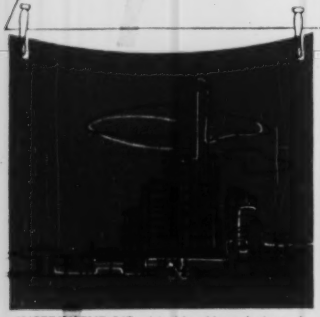

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PETROLEUM PRODUCTS—liquids, gases or gaseous hydrocarbons—can be dried to minus 100°F dew point—or *lower!*

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Alcoa Activated Alumina is the "old reliable" in the desiccant field. It dries to lower dew points than other commercial adsorbents. It will not swell, soften or disintegrate . . . can be used over and over again almost indefinitely.

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Production AND Engineering NEWS AT A GLANCE

LOOK FOR CHANGE—Carbon determination in steels by spectrographic analysis is definitely in the cards for the future. Rapid progress is being made on the principal problem which is one of adequate resolution for usable carbon spectral lines. Method will be rapid and when all the kinks are ironed out it will be another step in analytical instrumentation for the metals field.

PLANNED POWER SUPPLY—All branches of your plant's electrical system should reflect design flexibility. They must handle normal and emergency loads and be able to adjust to expanded future loads. There are 11 recognized distribution systems, all good, all having a field of application and all composed of one or more of the four basic elements. These are: Primary feeders, secondary feeders, radial and network-type circuits. Here is some information on how to be sure that your electrical system is ready and able to take what comes. p. 72

SAMPLE THE AIR—Sampling and measurement of air pollution is a complex technical task and new techniques forge to the front rapidly. At a recent ASME symposium a special filter for capturing particles smaller than 1/25,000 of an inch was described. For sampling hot gases which destroy most ordinary filters Harvard laboratory has fabricated special glass cloth filters.

MORE LIVES THAN A CAT—Many times a jig becomes a special-purpose tool which is good for just one job. It isn't always true, however. One perfect example is a jig which will help drill any of 16 different-sized cross-holes in any shaft from ¼ to 1½-inches in diameter. The jig clamps the work in place to prevent rotation and has an indexing overhead table with the drill bushings. It could save a great deal of time in many different shops. p. 74

NEW BATTERY—A storage battery with plated aluminum grids has been developed by the U.S. Army Ordnance Corps and the University of Michigan. Lowered self-discharge rate and full effectiveness at temperatures ranging from minus 55° to 165° F make the battery potentially useful not only for army and civilian vehicles but also for emergencies when public power fails.

ROOM FOR MANY—When it comes to welding the assemblies for the jet engines there's room for almost every welding method. Many different types of metal are used in many different ways. Hand, semiautomatic and automatic welding can all be used depending on the application. Welding of dissimilar metals is one of the problems. There are others. Mostly it's a matter of selecting the right method. p. 76

BETTER TEST—An extensometer that automatically releases itself from the test specimen before the brecking point is reached, and without topping the test, has been developed by engineers at Battelle Institute. The breakaway feature is particularly useful in testing high-temperature metals and alloys.

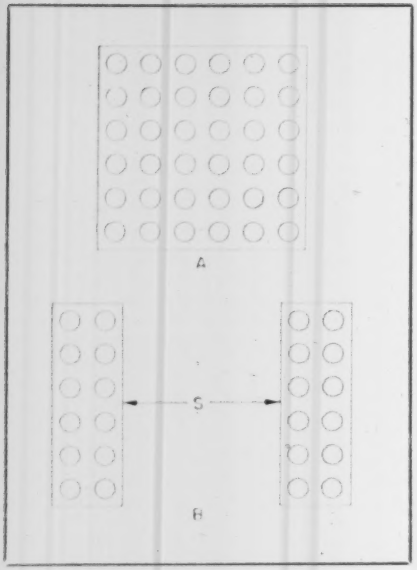
TOUGH WELDING JOBS—Inert-gas shielded consummable electrode arc welding is paying off in a number of aluminum welding jobs previously considered difficult or impractical. Process is particularly suited to fillet welding and is used widely in butt welding of material thicker than ⅛ inch. It is also used for machine applications on lighter gage material. Non-heat treatable alloys may be welded as can also some of the heat treatable alloys.

JACKETED NAILS—Produced from special heavy duty steel wire that has a thick copper jacket, molecularly welded to the steel, a new nail just introduced by Fanner Metal Products Co. boasts a superior corrosion resistance. The nail making method was developed in Germany and requires special machinery in processing. Uniform copper coating at all points including the nail head enhances appearance as well as improving corrosion resistance.

GAS PLATING MOLY—Adherent coatings of molybdenum are deposited on titanium by a vapor plating method developed by Sam Tour & Co. Molybdenum coating is produced by thermal decomposition of molybdenum hexacarbonyl with hydrogen as carrier gas. Hardness of the plate is 3 to 4 times that of the titanium base.

METALWORKINGS—A leak detector that can spot a leak so small it would take 31 years for a thimbleful of gas to escape is being manufactured by Consolidated Engineering Corp. . . . Aircraft manufacturers informed the Air Force they would prefer to do their own machining of forgings produced under the heavy press program rather than have this work done in several centralized machining depots . . . A hundred-foot drop tester in operation at the Naval Ordnance Laboratory simulates a free fall up to 100 feet at accelerations of 50 to 250 G. It requires only 10 feet vertical clearance for operation, is relatively inexpensive and can be moved to scene of operations. Drawings and specifications will be made available to ordnance contractors who wish to duplicate it for quality control.

Metalworking Outlook—p. 35 *Market Outlook—p. 105*



Duct bank at top is example of poor practice; cables in inside cuts must be derated. The 4 x 6 bifurcated arrangement is good practice. Cables are in outside rows, require no derating. S should be 1½ x height

Power System Planning Pays Off in Potential

All segments of a plant's electrical distribution should reflect design flexibility. They must handle normal and emergency loads and be able to adjust to expanded future loads

By F. L. AIME
Electrical Engineer
Anaconda Wire & Cable Co
Hastings-On-Hudson, N.Y.

HOW adequate is the so-called "adequate" electrical system in most plants? Unfortunately, the answer to this question usually isn't known until there's a costly power failure or a projected plant expansion. Adequacy encompasses much more than the ability to handle normal load.

Basically, the electrical distribution system is the key item in the plant. Composed of power load centers, secondary circuits and motor feed or branch circuits, the system must be designed for reliability in normal operation, reserve capacity in emergencies and flexibility for future expansion.

Many Systems—There are 11 recognized distribution systems, all good, all having a field of application and all essentially composed of one or more of the four basic elements. These are: Primary feeders, secondary feeders, radial and network-type circuits.

Radial system, the oldest and simplest, is primarily a one-source feed, and is still good for some applications. The network system is primarily a choice of two or more feeds.

A Sample Cure—Typical of an application needing revamping was a large fabricating company in the east which had inherited a radial system at 550 volts with feeders 200 to 3000 feet long. Frequent interruptions were the rule. Lamps continually burned out; maintenance and lost production time was extremely costly.

The cure? Transformer step-down substations with primary voltage of 13.8 kv were located at strategic points; secondary feeders were kept short, and separate 550-volt feeders with air-cooled, dry transformers were conveniently located for lighting. Only two sizes of secondary feeders (750 Mcm and 4/0 Awg) and three sizes of branch circuits (500 Mcm, 4/0 and No. 4 Awg) were installed, all being more-than-adequate to carry the load.

Avoid Bottlenecks—Another approach to adequacy of system is the elimination of bottlenecks—physical, electrical and thermal—in the planning stage. Examples of physical bottlenecks include undersized duct banks and conduits that limit future growth, conduit bends with too-small radius for larger cable, cramped manholes and pull boxes, small panelboards, messed-up circuits and inadequate protection against physical hazards.

Electrical bottlenecks frequently encountered are: Small load-center reserve capacity, poor regulation on primaries and secondaries, cables without spare or emergency capacity, and load centers with inadequate provision for growth, flexibility, service restoration and transformer overload.

Thermal bottlenecks are more difficult to analyze, but the best rule of thumb is—too much heat is the enemy of long cable life.

Use Right Cable—Insulation reliability is obtained by selecting the correct cable, conductor size, type insulation and covering for the particular job. Insulation deteriorates rapidly if the wrong cover is selected, if the conductor

is overloaded, or if, at normal load, the ambient temperature is too high.

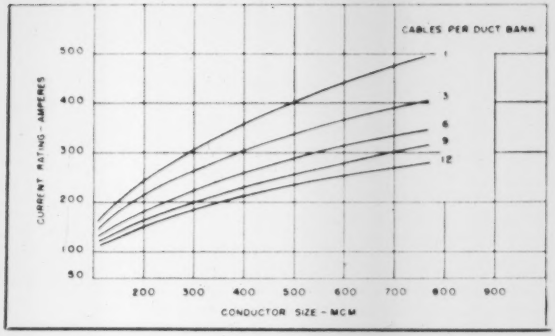
Neoprene-jacketed, rubber-insulated cable is replacing lead-covered cable in many applications. It can be installed overhead, in ducts, directly buried or all three in combination. Advantages are many: No corrosion, good abrasion resistance, excellent resistance to sunlight, oils, greases, gasoline, chemicals, fumes, etc.

Who Gets the Job?—No contractor should be expected to do engineering work on a job unless he has his own engineering department. Problems involving cable and equipment selection should be settled in advance of bids. Many able contractors can suggest savings in installation without reducing quality.

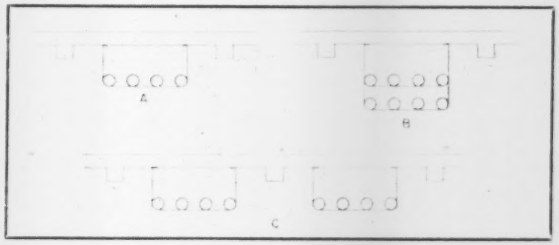
Low bid may not result in the cheapest job. With an owner who doesn't know, substitutions can be made in the wiring. Thinner, lower quality insulation and coverings, cables not approved by Underwriters Laboratories Inc., short radius conduit bends, unlubricated cable pulls that damage cable, poor soldering, connecting or terminating practice, wrong conductor size, ducts and conduits with moisture traps, etc., are some of the practices of an unscrupulous contractor.

The Crisis — In an emergency, economy is secondary. It is too late to kick one's self for penny-pinching or insufficient foresight. Greatest economy for today's emergency will have been achieved by planning and installing, months ago, a cable system built to handle it. Such a system includes:

1. Ample-sized conductors, correct insulation and covering, properly installed.
2. Provision for duplicate or triplicate feeders and branch circuits when advisable.
3. Substations, power load centers and panel boxes with adequate safety protection to cables.
4. Sufficient ampere capacity in conductors to handle short circuits, especially in motor feeders.
5. Ability of insulation to withstand temperature rise due to normal and expected overload without overheating.
6. Sufficient inspection and maintenance so that the operator knows his system is in good shape.



Curves show relative current rating for 1 to 12 cables in a bank. Values are for 3 c 23 kv, shielded type paper-insulated cables



Three methods of installing conduit. A and B methods are more desirable since derating factor is 0.88 by comparison with the single conduit. System B shown here is derated by 0.81

7. Personnel trained to handle any situation.
8. Electronic or dry-plate rectifiers for d-c service to exit lights, cranes, elevators.
9. Primary or secondary tie cables from another load center or substation.
10. Automatic gas-electric generators or automatically-charged storage battery for emergency lighting.

Future Loads — Smaller blocks of added power can be handled by installing originally, open-end load centers and increasing them 100 per cent or more. Larger blocks of additional power may require extension of the system at primary voltage (up to 69 kv) to additional points, establishment of new substations and load centers, installation of additional cable feeders, tie cables and secondaries as required.

Some points to remember when considering future growth are:

1. Build duct banks with all outside ducts for power cables so present cables need not be derated needlessly.
2. When additional cables are added to duct banks, the new and old cables should be rerated according to the total number of cables.
3. Adding feeders in conduit or in open wiring indoors requires sufficient physical separation to prevent new or present suffering from mutual heating and consequent loss of safe-current carrying capacity.
4. Bus duct provides a good means for handling expansion within reasonable physical limits, say on a large floor, for comparatively heavy current at 600 volts or less; equally good when supplemented with bus-drop cable, in supplying whole banks of machinery at new locations.
5. Keep power factor of the load as high as practical and save useless ampere load on cables; such as by adding capacitors at or near the load, synchronous motors (larger sizes, continuous duty)
6. Load factor, often neglected, often can be improved by recombining loads on feeders. High load factor is most economical per dollar of cable investment.

VERSATILITY IN A JIG

Range of drill bushings mounted over three different-sized V-blocks gives this jig many lives when it comes to drilling cross holes in round shafts

By F. E. RILEY
Tool Engineer
London, England

NO PROBLEM is more familiar to the production-assembly men than that of having to drill a cross hole in a round shaft.

It's a simple operation but can take more time than it's worth. Still it has to be done often enough to make a simple and versatile jig for the job a welcome addition to many production lines.

Although the basic principle is the same, whatever the hole or shaft size, it is an all too common practice for tool designers to specify a series of separate drill jigs for each size component.

Takes 'em All—In an attempt to drill all the shaft cross-holes which arise in the production of a range of components one universal drill jig will enable 16 different hole sizes to be drilled in any shaft from $\frac{1}{4}$ to $1\frac{1}{2}$-inches in diameter. This flexibility makes the jig good for universal application.

The 16 different drill bushings cover a drill diameter range from $\frac{9}{64}$ to $\frac{3}{8}$-inch in increments of $\frac{1}{64}$-inch. This range is adequate for a wide selection of taper pin reamers, parallel reamers and taps.

Revolving Disk — Bushings are mounted in a plate which rotates over the top of the jig. The plate has a central spindle which is rotatable within a steel sleeve welded to the fixture base plate.

A series of 16 notches with tapered sides is milled into the edge of the bushing plate so that the spring-loaded latch can be engaged with any one of them to hold the plate in position over any one of the three V-blocks with which the jig is provided.

Versatility — The V-blocks are positioned on three sides of the square fixture base. Each one is made to accommodate a range of bar or shaft diameters. The smallest one will take shafts from $\frac{1}{4}$ to $\frac{5}{8}$-inch diameter. Another takes shafts from $\frac{5}{8}$ to 1 inch. The third V-block accommodates shafts from 1 to $1\frac{1}{2}$-inches diameter.

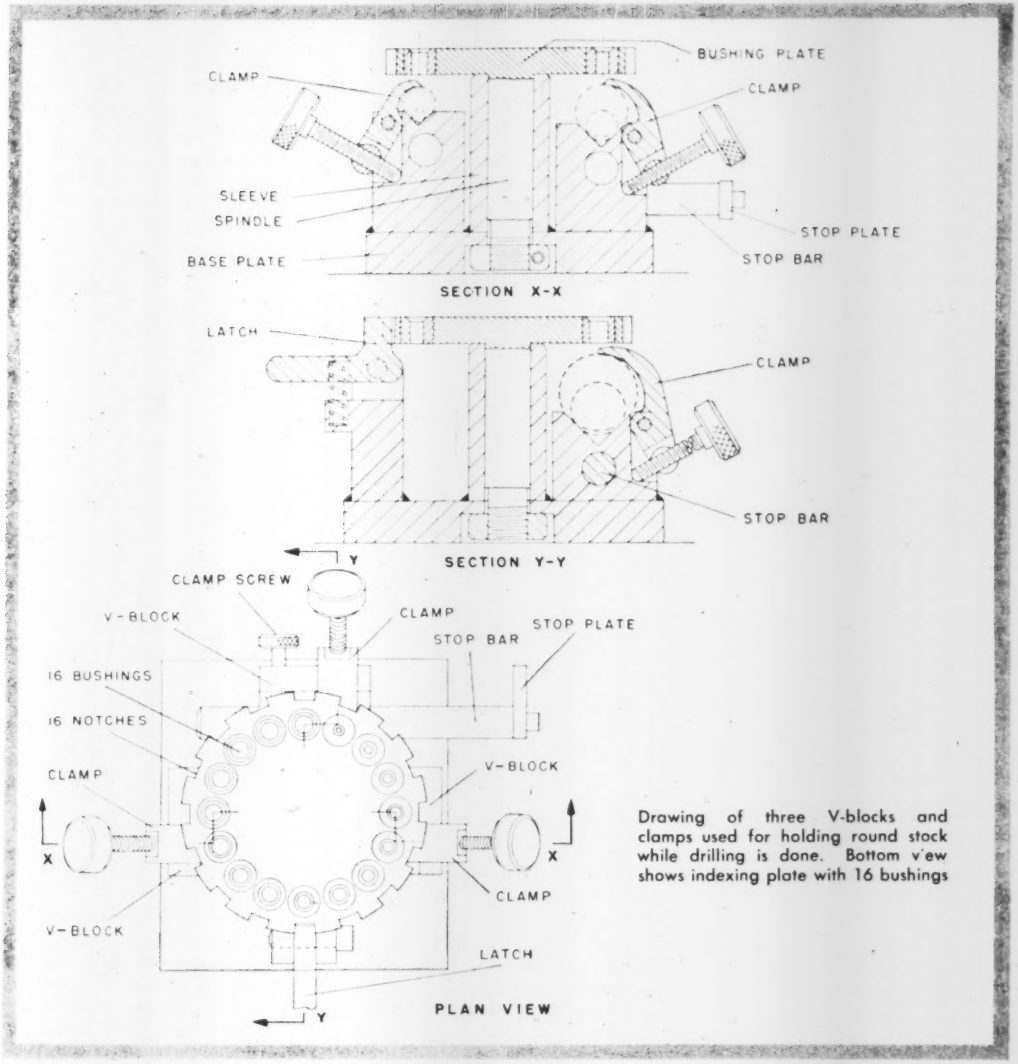
Any one of the 16 drill bushings can be located over any one of the V-blocks by indexing the bushing plate and locking it by means of the wedge-shaped latch.

Clamped Down—Each V-block is fitted with a clamp for holding the shafts in place for drilling. The clamps are arranged to swivel on pins under the action of the knurled clamping screws. They are designed for light duty, as the pressure exerted on the work is merely to prevent it rotating within the V-block when the drill first contacts the shaft surface.

Clamps must be of light construction because if the clamping end was thick excessive clearance would be necessary under the bushing plate, thus causing the drills to project a long way from the bottom end of the bushing. Support for the drill would then be reduced and it would tend to wander off center.

One Case — In many instances, clamping of the work is unnecessary, but the clamps are useful when it is desired to open out one end of a drilled hole.

Bushing plate would be rotated to bring the correct diameter drill bushing over the work. The drill is then changed and replaced by the tool for opening out the hole



Drawing of three V-blocks and clamps used for holding round stock while drilling is done. Bottom view shows indexing plate with 16 bushings

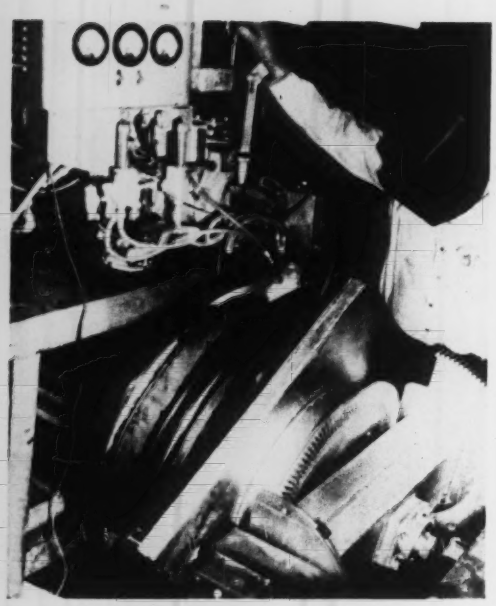
end. This second drill is accommodated by indexing into position the required size drill bushing. The clamp prevents displacement of the workpiece while the tools are being changed.

Mass Production—For batch production drilling of shafts, a length stop is provided to enable the drilled holes to be placed at a set distance from the shaft ends. The stop comprises a straight length of circular steel bar with a flat stop piece secured to one end by a socket head screw.

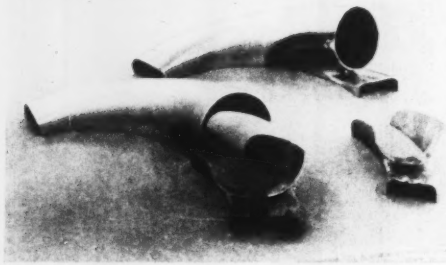
Stop bar is located in a hole machined through each V-block and is secured by a clamp screw. The stop bar and clamp screw are designed to be slipped into any one of the three V-blocks. This feature prevents the user from becoming confused as to which V-block he is using at any particular time.

Jig Anatomy—The jig construction is largely of welded steel, the body being machined as a unit after all V-blocks and the vertical bearing had been welded in place on the base plate. Holes in the bushing plate, into which the drill bushings are pressed, are all bored to one standard diameter.

This allows other bushings to be placed in position if the need arises. So far, the range of 16 diameters provided initially has proved suitable for a very wide range of work.



Large stainless steel jet engine component is welded with an automatic sigma welding machine. Sigma welding is best for material that is 3/32-inch or thicker



Welding Meets Jet-Engine

Various materials used in the fabrication of jet engines invite application of several welding methods. Welding of dissimilar metals is only one of the problems

WELDING processes of all types offer many opportunities for reducing costs in jet-engine fabrication. They can allow smaller and simpler subassemblies which are then welded together. Large, expensive forgings or plate sections requiring considerable machining can be entirely eliminated in many cases.

Functional design of jet engine parts is tied in closely with material properties at high temperatures. Materials selected have a bearing on weldability problems.

Look for Advantage — Design engineers should and do consider material selections carefully, since some high-temperature alloys have more desirable weldability characteristics along with equivalent physical and mechanical properties.

Production supervisors are expected to overcome processing problems by devising new or modified fabrication techniques.

Basic Items — Several factors should be considered before welding high-temperature alloys, regardless of the alloy being welded, the filler rod used or the process selected.

Welds in high-temperature alloys should be evaluated on the basis of properties shown by high-temperature test results, not room-temperature results.

Stress Relief—Physical properties of the weld, not the base metal, should be used to evaluate weld properties.

An elongation of 5 per cent at operating temperature is sufficient ductility to relieve high nonuniform stresses, by allowing localized plastic deformation.

Silicon content in cast alloys should be kept on the low side of specifications to reduce hot-cracking tendencies.

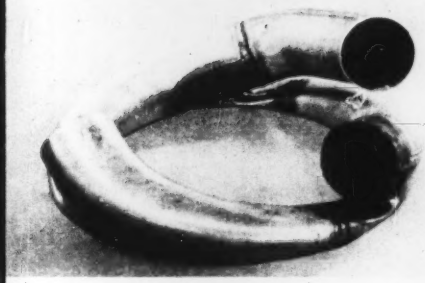
Check Techniques — Weldability of some of the super alloys appears to be very poor during preliminary test work. Most process difficulties can be overcome by examination of welding techniques.

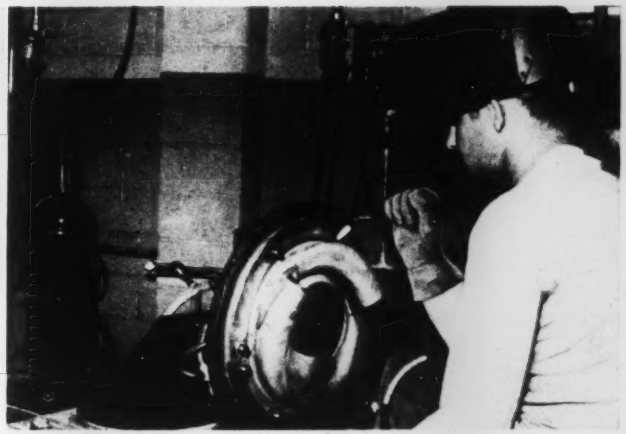
For example, the weldability of a given alloy will vary somewhat for the different welding processes. Don't be alarmed if an alloy can be welded easily with one process but not with another at first try.

Tungsten-Arc Welding

Heliarc welding is an arc welding process employing an inert shielding gas—usually argon—which envelops and protects the virtually nonconsumable tungsten electrode, the arc and the weld puddle from the atmosphere. Welds made with this process are flat, smooth and clean because no flux is used. This results in reduced finishing costs.

Jet engines have a high ratio of horsepower per unit weight and designers strive constantly to increase that ratio. One of the immediate advantages of inert gas tungsten-arc welded butt joints is weight-saving. Factors favoring butt joints should be considered whenever the opportunity arises to recommend joint preparations.





These three illustrations show a complicated fabricating job broken down into relatively simple steps. Finished unit is being readied above

Challenge

By K. H. KOOPMAN
Development Engineer
Linde Air Products Co.
New York

Low Cost—Another advantage of this welding method is that apparatus investment and maintenance costs are relatively low. It also offers advantages of greater adaptability to a wide range of metal thicknesses and types, as well as the valuable feature of portability.

Availability of sufficient welding power supply is another factor that offers fewer problems in the application of tungsten-arc welding. All of these points become more important as the size of the welding shop decreases. They probably are most important to the small subcontractor who must purchase most of the equipment he needs before production can be started.

A sufficient variety of part shapes and contours occurs in jet-engine components to utilize all types of tungsten-arc welding apparatus. Choice of manual, mechanized or semiautomatic welding apparatus depends upon the application. Practically all the metals used in jet engines can be Heliarc welded.

Advice—Several factors should be considered in order to make the best use of Heliarc welding for each application. Joint design, preparation and alignment should be good. Mechanical wire brushing or buffing improves the quality of welds made in many metals.

Weld backing should be metal such as copper, steel or stainless steel; gas such as argon, helium, nitrogen or burning hydrogen; or flux, depending upon metal and type of joint being welded.

Straight Polarity—Correct welding speed range reduces weld hot-cracking and undercutting along the joint edges. With this method direct current (straight polarity) reduces hot-cracking because the narrow weld gives lower contraction stresses and faster cooling through the hot-short temperature range.

Use the shortest arc possible to produce a narrow weld to reduce hot-cracking. About 0.040 to 0.060-inch is normally used.

Use the smallest electrode that will carry the required current. This will give a narrow weld and reduce hot-cracking.

Gas Flow—Use the lowest flow of gas that will still give a clean sound weld. Welding rod composition may have to differ from the base metal composition to reduce weld hot-cracking.

Correct vertical and lateral location of the rod feed governs weld flatness.

Many welds in jet engine parts are so short, are in such confined spaces or are so sharply curved that manual welding is the most logical choice. The hand torch is small enough to reach inside the more complicated weldments where there is little room for manipulation and is useful for repairs of engine parts after the engines have been in service for some time.

Severe Conditions—Manual welding torches with higher capacity ratings probably are preferred in cases where constant use under severe shop service is necessary.

One of the chief factors tending to discourage manual welding is the degree of operator skill required. It has been thought, with some justification, that most reliable results are obtained when the human element is reduced as much as possible.

High Output — Mechanization has proved practical to the greatest extent in high production industries. Many of the jet engine subcontractors are on mass production schedules and therefore are reluctant to use manual methods to any extent.

Exhaust cones, after-burners,

Heliarc semiautomatic welder easily follows joints with changing contour. In application of this kind an automatic machine is out

turbine cases and other shrouding sections offer a number of possibilities for mechanized longitudinal and circumferential butt welding. Most of these welded joints require auxiliary filler rod addition. Heliarc machine welding can be done with or without arc voltage control, depending on the weld joint design.

Electronic Control — Machine welds in material over 18-gage in thickness are usually made with filler metal, although rod addition is sometimes used on metal as thin as 0.035-inch. Rate of rod feed depends upon the amount of weld reinforcement desired. Highly accurate rod feed mechanisms are available which have an electronic speed control for maintaining a uniform rod feed rate.

Practical experience indicates that mechanized tungsten-arc welding with auxiliary rod feed requires careful attention to all welding conditions and principal welding factors.

Care Pays Off—Welding conditions must be maintained precisely to obtain consistently uniform results in penetration and in coalescence of abutted sheet edges. Satisfactory results have been produced only in those cases where more than the usual amount of effort has been expended. Mechanized welding applications are increasing, and the fabrication of large numbers of jet engine components will hasten pushbutton welding.

Another problem in mechanized welding is the control of initial joint gap settings, assuming that the fixture holds the parts firmly after pressure is applied. This point refers specifically to dimensional tolerances of parts prior to welding.

Gap Effect — For example, experience has shown that it is difficult to hold formed parts tightly abutting or to an exact joint opening, such as a 1/32-inch spacing. Trimmed edges of the joint vary sometimes so the edges are touching at some points and are separated by as much as 1/16-inch at others.

Penetration and reinforcement are affected directly and adversely by these conditions. It is mandatory to prepare joint edges straight and to hold gap spacing closely to get consistently good results with mechanizing welding.

Use a Jig—Most fabricators fail to understand the complexities of jigging until they have expended considerable time and effort trying to weld parts using ordinary practices. Precise setting must be held. Even minor variations are magnified a great deal when mechanically welding thin sheets of high-temperature metals at high speeds.

Joints that change contour in more than one plane generally will prohibit the use of fully mechanized welding, whereas manual welding speeds may not be high enough to satisfy high production demands.

The In-Between—Semiautomatic welding bridges the gap between manual and mechanized welding. It is useful for straight-line or circumferential butt seams in material up to about 3/32-inch thick where full penetration is desired in a single pass.

It is also used on lap joints. Since single-pass penetration is more difficult to obtain on thicker materials, sigma or submerged arc welding would be better choices on thickness of about 3/32-inch and greater because these processes will give good penetration at higher welding speeds.

Rod Propelled — Semiautomatic welding utilizes filler rod drawn from a reel by powered drive rolls, and fed into a tungsten-arc weld puddle through a flexible cable and nozzle attached to a modified manual welding torch.

The rod issuing from the nozzle, at a constant but adjustable feed rate, is pressed against the joint to be welded. Pressure required is not great, but there must be enough to prevent rod slippage. The rod then becomes the propelling means for the torch. It is melted under the arc to join adjacent base metal edges at the rate of about 1 inch of weld per inch of rod.

Welding speed therefore is about the same as the preset rod feed.

Creep—Lack of adequate jigging has been one of the principal deterrents to successful mechanized welding. Insufficient hold-down pressure allows sheets to "crawl" which results in varying joint gap spacing between the start and finish ends of the weld. Penetration and weld bead contour are affected by the changes in joint opening, creating problems of strength variation and excessive finishing.

Hold-down pressures as high as

400 to 500 pounds per linear inch are required to prevent sheet movement. Although greater fixture expense is necessary to produce these high clamping pressures, fixture makers are beginning to realize this condition and are now supplying well-designed fixtures.

Backup—The weld backup bar is another important item in the fixture because it governs heat distribution in the joint by appropriate chilling effects. Copper backup bars with relief grooves are recommended for welding many of the high-temperature alloys.

Copper offers good control of chilling effect because of its high heat conductivity and because it will not fuse to the bottom of the weld bead. Relief grooves provide the most reliable method of controlling heat distribution uniformly at the same time allowing good weld penetration without drop-through.

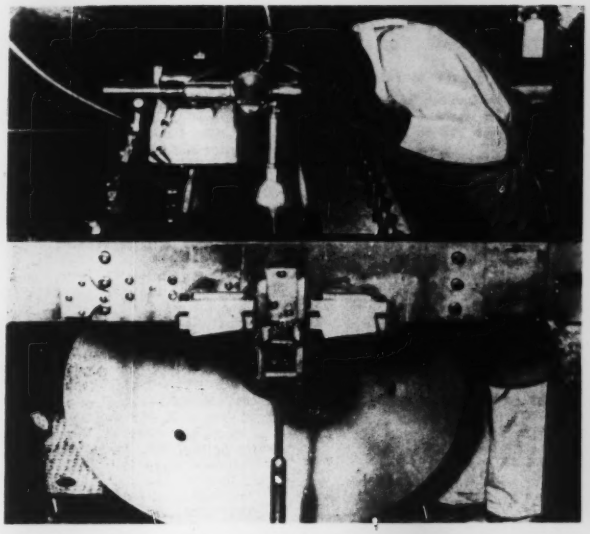
Gas backing and flux backing are also useful. Argon, helium, nitrogen or burning hydrogen are used, depending on the metal and weld joint design. If a flux backing is used, it should be low in boron compounds to prevent formation of flux-metal eutectics that have low ductility and melting point.

Sigma Welding

Sigma (shielded inert gas metal arc) welding process uses a consumable electrode as contrasted to the virtually nonconsumable tungsten electrode of the inert gas shielded tungsten arc process. Either hand or fully automatic equipment is available.

Sigma welding has a substantially higher rate of heat input and therefore is most useful for butt welding of material about 3/32-inch or thicker and fillet welding of 1/16-inch and thicker.

Although material as thin as 0.025-inch has been machine-welded at high speed, the weld reinforcement is too great on butt welded material less than 3/32-inch thick for most applications. However, for fillet welding the process is useful for machine welding of material down to 16 gage. Manual welding is applicable to fillet and lap joints of 3/32-inch and over, and butt welds of $\frac{1}{8}$-inch and thicker.



Heliarc machine welding setup makes a weld during fabrication of strong exhaust cones. Jigging holds metal firm and prevents crawl

Thick Sections—Best possibilities for sigma welding appear on the functional parts of jet engines, as opposed to the skin or shrouding parts. Experiments are being conducted on turbine wheels, for example, where reasonably thick sections might be welded better with the sigma process. This particular application has not been reduced to practice in production, but work is continuing.

Another use for sigma machine welding is in the fabrication of nozzle vanes. These are formed by folding 0.050-inch thick Stellite No. 25 sheet stock and welding the two edges to $\frac{1}{8}$-inch thick Stellite No. 25 blade extensions.

No Cracks—An investigation is underway to develop conditions for both sigma and submerged arc welding of turbine wheels joining 2-inch thick SAE 4340 steel hubs to Timken 16-25-6 rims. It appears that both processes will be successful in producing crack-free welds when using type 312 rod provided dilution with the austenitic 16-25-6 alloy is held low enough to retain about 5 per cent ferrite in the austenitic weld metal.

The process selected will be the one that gives acceptable weld quality at the lowest cost.

Environment — To help make best use of this welding process for each application, the best possible welding conditions should be established. To accomplish this, the same principal factors should be considered as in the case of tungsten arc welding except that a consumable electrode, rather than a tungsten electrode, and dc-reverse polarity welding current are normally used.

An additional factor of inclination of work is important. Welding uphill increases penetration, whereas welding downhill gives a wider flatter weld bead and permits faster welding on thin material.

Submerged Arc

Another fusion welding process that is being used for fabricating jet engine components about 14 gage and thicker is submerged arc or Unionmelt welding. This process is lower in cost than sigma welding for machine-welding applications, because the composition used to cover and protect the weld is less costly than the inert gas used in sigma welding. Larger diameter and lower cost rod is also used for Unionmelt.

In general, submerged arc welding speeds are substantially higher

LOGICAL CHOICES OF WELDING ROD* FOR JOINING DISSIMILAR METAL COMBINATIONS

Base Metal	Welding Rod
Type 410 to Inconel W & X	Inconel, Types 309, 310, 312
Type 347 to itself	Type 347, Oxweld No. 60, 312 rod (U.M.)
Type 347 and 310 to Multimet alloy	Multimet alloy, Hastelloy alloy W, Types 312, 309 and 310
Type 314 to itself	Type 316, 312
Type 310 to Stellite alloy 21 blades	Hastelloy alloy W, Types 312, 309, 310
Inconel to Hastelloy alloy C	Nickel and Inconel
Inconel X to No. 21 Stellite alloy	Inconel, Hastelloy alloy W, Types 312, 309 and 310
Type 410 to 310, 321, or 347	312, 309, 310 or Inconel
Type 410 to 304	304 and 410
Hastelloy alloy B to C	Hastelloy alloy W
Inconel W or X to Hastelloy alloys B and C	Hastelloy alloy W
S-816 to Timken 16-25-6	Hastelloy alloy W or Types 316, 318, Inconel
Timken 16-25-6 to Stellite alloy No. 30	Inconel Hastelloy alloy W
16-25-6 to Stellite alloy No. 21	Inconel Hastelloy alloy W, Timken 16-25-6, Type 312
16-25-6 to Hastelloy alloy C	Inconel, Hastelloy alloy W, 19-9DL, Types 312, 316 and 318
19-9DL to Stellite alloy No. 30	Hastelloy alloy W, Inconel, Types 312, 316, 318, 309, 19-9 WMo, 310
S-816 to Type 501	Inconel, Type 312, 316, 318, 16-25-6, 309, 310
16-25-6 to Type 501	Hastelloy alloy W, Inconel, Type 312, 309, 316, 318, 310, 16-25-6
16-25-6 to 4340	316 ELC, 318, Multimet (L.C.), 316, 309, 312
Multimet alloy to Type 316	Hastelloy alloy W
Multimet alloy to Stellite alloy 23 & 30	

* The rod selection sometimes varies for different welding processes.

than those possible with other fusion welding processes. Although alloy losses during weld metal transfer are somewhat greater than those in sigma or inert gas shielded tungsten arc process, effective control of weld metal composition is obtained through the choice of granular Unionmelt material and welding rod alloy content. These will produce desirable metal-flux reactions during welding.

Accelerated Welding — Because of low welding cost, high welding speed and easy production of desirable weld metal properties, mild steel and low alloy steel jet-engine components, such as air-compressor stator cases, should be welded with the Unionmelt process.

As an example, some 14 gage NAX low-alloy steel compressor cases are being Unionmelt butt welded at 100 inches per minute. Severe undercutting along each side of the weld would have occurred at speeds far less than this with any other fusion welding process.

Welding costs would also be far higher with other processes. In addition the Unionmelt welding process provides a high degree of operator comfort, because the arc is submerged. Very little arc flash, heat radiation or fuming occurs.

Stainless—On the basis of low cost, this process should also be considered for welding highly alloyed materials such as stainless steels and high-temperature alloys. Correct selection of welding rod and welding conditions will often overcome the weld cracking problems associated with some of these alloyed materials.

In many cases the use of smaller diameter welding rods for multi-pass welding will eliminate hot-cracking because the narrow stringer beads deposited at higher speeds will cool through the hot-short range more rapidly and better resist thermal contraction stresses.

Build-Up — The submerged arc process, because of its low cost, should also be investigated for building up integral bosses on the surface of parts, or to provide material for flanges. It can often be applied for surfacing of metals with stainless steel or wear-resistant materials whenever needed.

Sigma welding should also be considered for depositing integral bosses and studs as well as for surfacing operations. Despite its apparent greater cost, there are cases where the alloy composition desired in the weld metal may be obtained more readily with sigma welding.

Economy — The general rule would be that if welds of satisfactory quality can be made in material of 14-gage thickness or over, the submerged arc process should be recommended because it is the most economical.

To help make the best use of this process for each application, the best possible welding conditions should be established. To accomplish this the same principal factors will apply as in sigma welding except that the Unionmelt compositions and its sizing should also be considered.

Grades N and 50 are normally used for the nickel-base alloys, grade 80 for the austenitic stainless steels and grade 50 for thin-gage low-alloy steels. The coarser particle sizing normally gives a deeper and narrower weld than the finer particle sizing. Direct reverse polarity current or alternating current is normally used instead of the dc straight polarity used for Heliarc welding.

Aluminum Plant 'Stretches'

BY ACTUALLY "stretching" existing equipment at its Longview, Wash. smelting plant, Reynolds Metals Co. recently succeeded in expanding its aluminum production 67 per cent—and saved $8 million in the process.

The increase was achieved by enlarging each pot in the plant's three pot lines, a total of 372 pots. Pots built in 1941 were removed a few at a time, trucked 60 miles to Portland, Oreg., where a steel fabricating concern made each two feet longer and two feet wider.

Add Two Feet — After the stretching process, each pot was 21 x 8 feet. As a result, the amperage flowing through each could be increased from 32,000 to 54,000 with a resultant two-thirds boost in productive capacity.

While the fabrication was going on, production was maintained at more than 50 per cent of the plant's original capacity.

No Leakage
No Lubrication

That's why Ingersoll-Rand's advanced design
DMV and DHV PUMPS
can end your maintenance problems in general hydraulic service

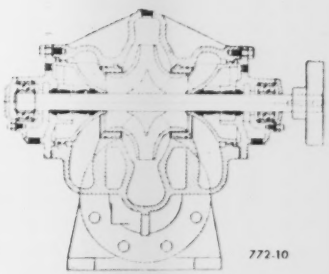
SINGLE-STAGE
DOUBLE-SUCTION
HEADS TO 340 FT.
CAPACITIES TO 2100 GPM
TEMPERATURES TO 200° F.

- **Extra Protection Against Shaft Leakage** through use of efficient *double* shaft seals in place of usual, packed stuffing boxes.
- **Double Shaft Seals** end stuffing box maintenance.
- **Longer Seal Life** assured with *double* shaft seals. Clean sealing water is injected to protect sealing surfaces when pumping gritty liquids.
- **Sealed, Cartridge-Type Bearings** require no lubrication throughout their service life.

These advanced design features make the DMV line the simplest and most maintenance-free single-stage double-suction pumps ever developed by Ingersoll-Rand for general hydraulic service. Ask your nearest I-R representative for complete information on this latest pumping development.

✔ Double Mechanical Shaft Seals

✔ Permanently Lubricated Ball Bearings



772-10

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COMPRESSORS • PUMPS • AIR AND ELECTRICAL TOOLS • VACUUM EQUIPMENT • ROCK DRILLS • CONDENSERS • GAS AND DIESEL ENGINES

Dust and Fume Elimination Investigated

Some shops equip electric furnaces with hood and exhaust system for better visibility on working floor; others experiment with roof offtakes and filter system

HOODED control for the elimination of dust and fumes from electric furnaces uses the principles applied to other dust-fume producing points in a mill to obtain at least as good results with one-eighth to one-fourth as much air. So declared J. G. Liskow, dust control division, American Air Filter Co., Louisville, at the fume control session, Electric Furnace Steel Conference, AIME, Hotel William Penn, Pittsburgh, Dec. 4-6.

Former attendance records were broken at this year's conference when registration reached 826. Next year's annual meeting will be held in Cincinnati.

Officers for 1953 Electric Furnace Steel Committee: Chairman executive committee, W. M. Farnsworth, assistant district manager, Central Alloy and Chicago District, Republic Steel Corp., Massillon, O.; chairman conference committee, F. O. Lemmon, superintendent, metals processing, Ohio Steel Foundry Co., Springfield, O.; secretary, Ernest Kirkendall, AIME, Headquarters, New York.

The hood size is governed by the roof-ring diameter, Mr. Liskow continued. Add to this inverted cup, extensions over the charging or slagging doors and the pouring spout, and provide a means of exhausting air with the dust and fume, then the basic work is done — except that the electrodes must go through this and not touch it. The material around the electrodes will be subjected to about 3000° F when the electrodes are raised.

Roof Life Unchanged—Operating practice on a hooded electric furnace in Baltimore disclosed no difference in the roof life nor any increase in the electrode consumption. In time the hood warps because of the heat.

At the No. 2 electric furnace shop at South Works, United States Steel Co., Chicago, smoke and fumes were so dense at times as to stop the movement of overhead cranes. This condition, however, was remedied, according to John Harrod, superintendent, by hooding the furnace to direct the fumes into a stationary flue which goes down through the furnace platform. From here the dust and gases are led through a tunnel to the backside of the shop where a 45,000 cfm fan exhausts them outside the building. A constant circulation of air around the electrodes, he stated, has no effect on electrode consumption. While 50 per cent more time is required to change a roof of the furnace because of the hooded arrangement, there is a 70 per cent increase in roof life and consequently fewer number of roof changes. Other furnaces in the shop are now being equipped with similar type hoods and exhaust equipment.

Highest emissions of dust and fumes from electric furnaces occur during the meltdown period in the opinion of M. Dorfan, Mechanical Industries Inc., Pittsburgh. He emphasized that dust and operating conditions for larger electrics are similar to smaller ones, varying with the nature of the raw material and the kind of steel produced, but fume losses are higher ranging from 0.5 to 0.6 per cent of the process weight.

Pressures Vary—Mr. Dorfan described a unique method of controlling fume on a 14-foot 3 inch outside diameter, 25-ton per batch, electric furnace. Extensive research into prevailing pressures over full operating periods indicated that pressures within the furnace varied in accordance with a well-defined pattern which in itself varied with the furnace operating period. The magnitude of pressure varied between 0.010 to 0.060-inch H_2O (positive pressure); there were specific zones of pressure prominence and the reverse thereof; and there appeared to be a limited area of roof where exhaust provision seemed indicated.

Instead of operating with positive pressures within the furnace varying between 0.01 and 0.060-inch H_2O, negative pressures were maintained between 0.01 minus and 0.03-inch.

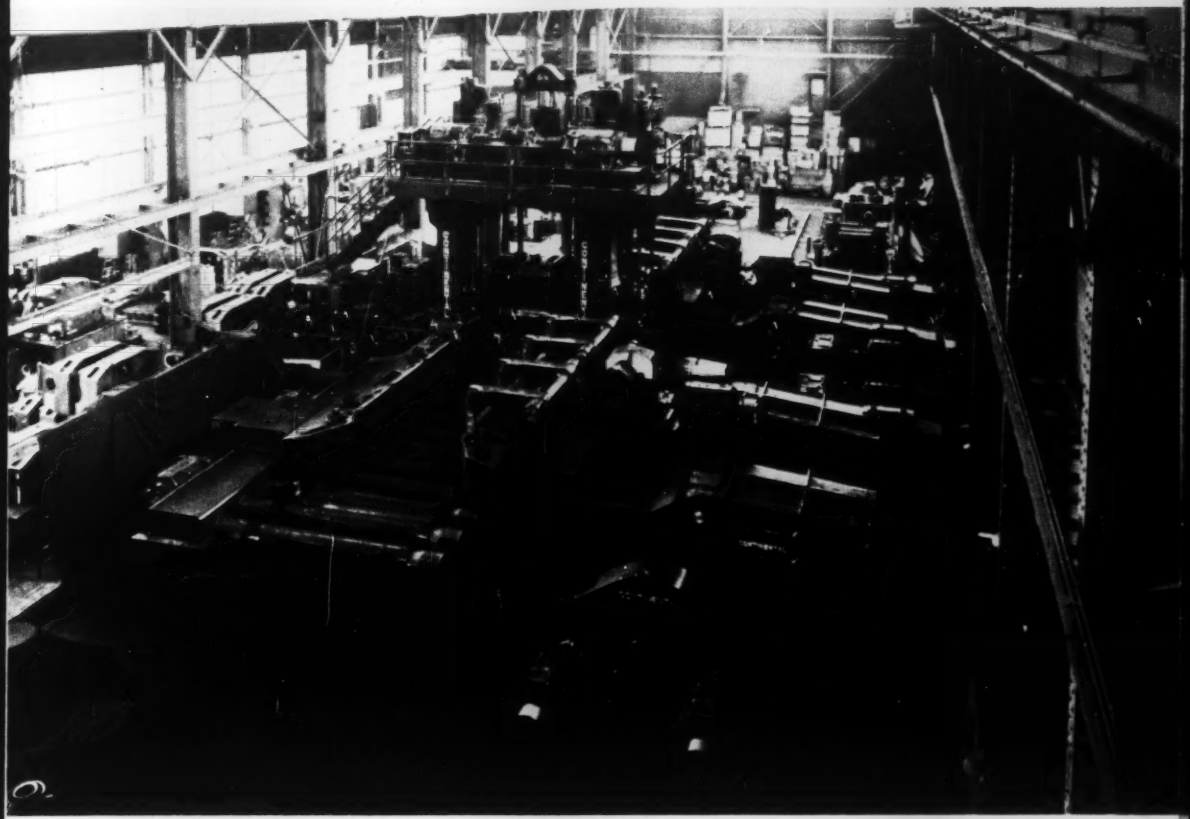
Equipment now being used on a fixed top electric furnace includes two outlet pipes in the furnace roof, 90° apart, which merge into a single flue connecting with two cyclone collectors in parallel. Finely atomized water may be added to the gas stream for the purpose of temperature reduction, conditioning of gas, and promotion of particle agglomeration. An operating temperature between 450 and 550°F was selected. A takeoff at the top of the cyclones leads the gases into a 3-cell continuous Dorfan impingo filter. Each cell consists of two louvered, vertical faces so arranged that granular material (steel chips) in its downward fall will not permit the expulsion of the granules through the louvers but only through the bottom of each cell. The granular material leaving the bottom of the cell is fed to an elevator which hoists it to the top of another cell. The feeding cycle in sequence is cell No. 3, 2 and 1 so that the dirtiest granules are at the entrance and the cleanest granules at the exit of the cell system. Gas from the cells pass through a fan and are exhausted into the atmosphere.

Essentially then, the method of operation is to draw the gaseous solids through the roof of the electric furnace and pass it through constantly moving beds of granular material. This effects the separation of dust by impinging the solids onto and filtering the gas through the moving bed of granular materials.

Gases Are Sprayed — In commenting on this method of fume collection Walter Assel, chief engineer, Timken Roller Bearing Co., Canton, O., said that two fundamental principles must be recognized, namely, gathering the fumes at the furnace and the removal of the particles from the fumes. A pressure of minus 0.03-inch water column is carried in the furnace and is controlled. By injecting a

CONTINENTAL

SHOP ASSEMBLY OF A 40" BLOOMING MILL WITH TABLES AND MANIPULATOR AT WHEELING PLANT



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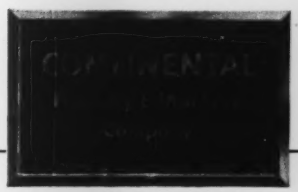
CASTINGS carbon and alloy steel from 20 to 250,000 pounds

ROLLS iron, alloy iron and steel rolls for all types of rolling mills

WELDMENTS fabricated steel plate, or cast-weld design.



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How would you solve it?

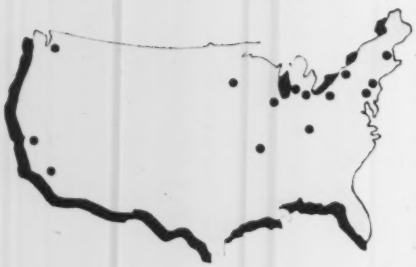
Production Problem:

Grind and finish shotgun barrels in one high-speed operation

1 Winchester Repeating Arms Co., New Haven, Conn., turned this grinding and finishing problem over to a 3M Methods Engineer who used his wide knowledge of coated abrasive applications, and came up with a solution.

2 His answer to this problem was a conversion to backstand equipment with fast-cutting abrasive belts. A backstand idler was also recommended—plus the correct abrasive belt, proper grit size and most efficient operating speed.

3 Now Winchester uses the 3M Method to rough grind and finish shotgun barrels more than twice as fast as with their previous method of using set-up wheels—with smoother finishes, too!



4 3M Methods Engineers, in demonstration rooms throughout the country, are ready to help *you* cut grinding and finishing costs. For more information and a copy of "Step Up Production," write: 3M, Dept. ST122, St. Paul 6, Minnesota.

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3M
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1902 ★ 1952

Made in U.S.A. by **MINNESOTA MINING & MFG. CO.**, St. Paul 6, Minn.—also makers of "Scotch" Brand Pressure-sensitive Tapes; "Scotch" Sound Recording Tape; "Underseal" Rubberized Coating; "Scotchlite" Reflective Sheeting; "Safety-Walk" Non-slip Surfacing; "3M" Adhesives. In Canada: London, Ont., Can. Export: 122 E. 42nd St., New York City.

spray of water into the gases leaving the furnace the temperature is reduced to 300 to 500°F. He cautioned that the furnace doors must be closed or the pressure balance is upset thus allowing fumes to issue from the doors.

W. E. Lewis, vice president, Pittsburgh Lectromelt Furnace Corp., Pittsburgh, mentioned that the emission of particle materials increases as the size of the furnace increases. He announced that two 22-foot electrics with circular openings are now in operation but no data is available. Fumes are drawn downward and thence to a stack; exhaust fans work in proportion to the amount of gas handled. He pointed out that contact filters may be used in order to reclaim valuable alloy particles.

Miscellaneous comment brought out the following data. Temperature of the gas in the duct while the furnace is undergoing evacuation varies. During the meltdown the gases are not hot; during the refining period 1800°F is recorded at the offtakes in the roof; and with a carbide slag the gases have a bright red color. One shop using stainless steel ducts to the floor level is advocating a refractory lining. Consumption of spray water used to cool the gases amounts to 6 to 8 gpm. At shops where oxygen injection is practiced the exhaust is stepped up 10 per cent to obtain the peak of the dust.

Conical Stencil Eases Spraying

Painting dials on B-16 type compasses is a simple operation at Temco Aircraft Corp.'s overhaul division at Greenville, Tex., with development of a special stencil in the company's Dallas engineering and tooling departments.

Since the dial of the compass is in the form of a truncated cone with the degree marked on the side, it did not lend itself to normal painting operations. A hollow cone stencil that fits over the face of the dial was devised, and the whole piece mounted on a swivel base for rotating while paint is sprayed on with an ordinary spray gun.

Use of the stencil has eliminated the necessity of tedious hand painting on the dials. At the same time it insures the accuracy of every dial painted, company officials said.

Die-Pressed Porcelain Supply

Recent expansion and modernization permits Washington Porcelain Co., Washington, N. J., a subsidiary of Arrow-Hart & Hegeman Electric Co. to supply die-pressed porcelains for all electrical applications. Produced by the dry-mix process, these porcelains will be supplied either glazed or unglazed.

Continuous process, oil fired tunnels are used instead of the older conical kilns, and a system of automatic controls is employed to assure uniform high quality.

Booklet on Solenoid Valves

Industrial applications for solenoid valves are discussed in a bulletin published by Atkomatic Valve Co., Indianapolis. Available for pressures up to 3000 psi, the solenoid valves have adjustable timing closing strokes to pressures of 300 psi. Copies of the bulletin are available through company representatives in district offices.

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MEANS BETTER COLD-ROLL FORMING
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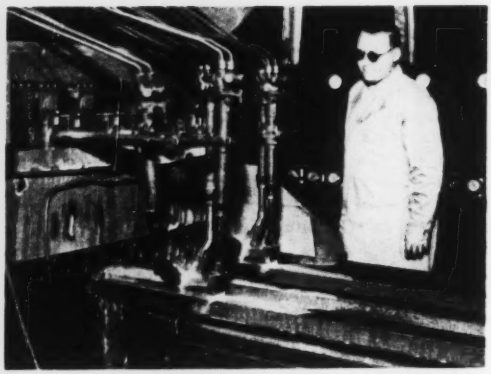
Machine bed rides under the torches on independent dollies. A motor-drive screw pulls dollies at a predetermined rate. Thirty-foot bed lengths can be handled. Hardened ways require only a finish grinding operation



Six torch units cover both sides of the V-ways and the tops of the flats. Water following the torches keeps torch tips cool and also quenches hardened ways. Height of torch, gas flow and water pressure are variable

Bed Ways: Hardened Under Fire

WHILE THEY were in the process of giving a new look to their production system (STEEL, Oct. 27, p. 74) the engineers at Monarch Machine Tool Co., Sidney, O., also took on another job.

They designed and constructed a new machine for the flame hardening of lathe bed ways. Unique in some respects, this oxyacetylene machine replaces an earlier one also of Monarch design; but of smaller capacity and somewhat different design and operation.

The Difference — Original machine was limited to bed lengths of 13 feet or less. Also it used torches which moved the length of the bed. Bed was held stationary and partially immersed in a tank of water which served for quenching. By contrast, the new machine accommodates bed lengths up to 30 feet, has the bed move beneath torches, which are held stationary and uses a water-jet system of quenching.

Lathe bed flats and V-ways are hardened to provide surfaces that will retain their accuracy over a long period of years.

A Blend — The lathe beds are made of high-strength alloy cast iron. This material has good characteristics when flame-hardened. Because of the speed of flame hardening the surface heating time is short. There is a gradual blend of the martensitic hardened layer into the tough under body of fine pearlitic iron.

Graphitic carbon normally found in pearlitic iron is retained, providing a multitude of microscopic reservoirs for retention of way surface lubricants. Distortion is kept to a minimum, and hardened way surfaces require only a finish grinding operation. Way sections thus have high wear resistance, but remain an integral part of the bed casting.

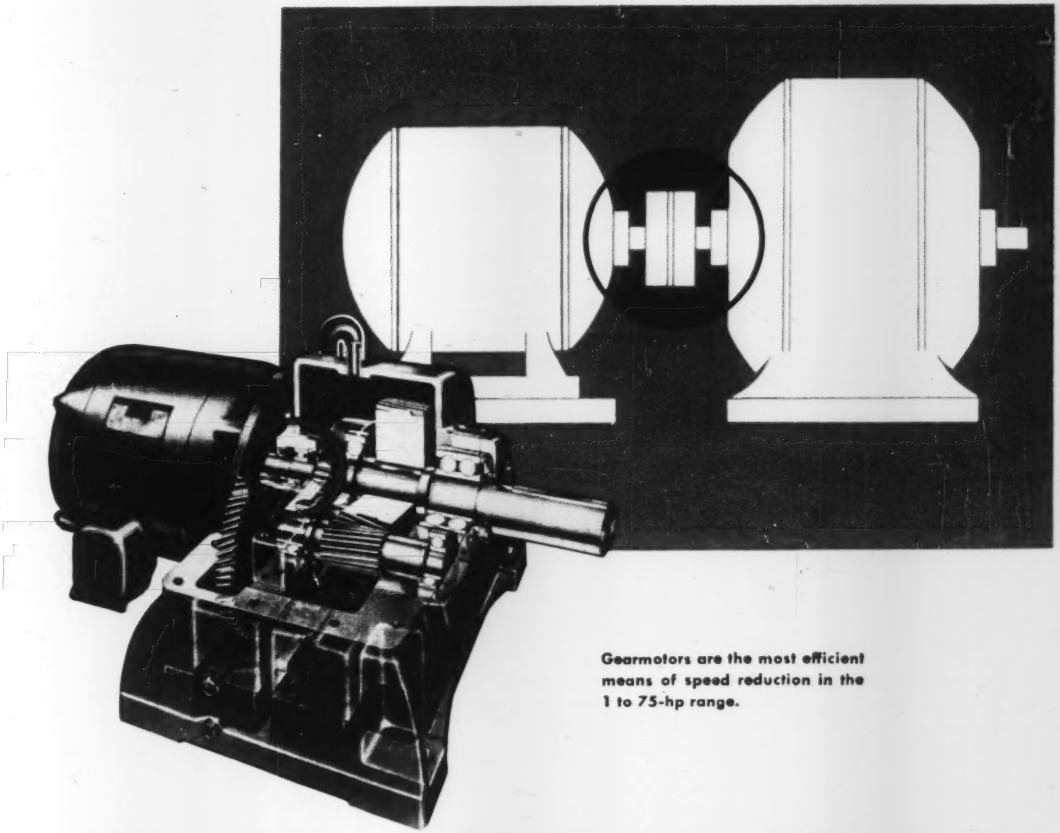
Fire and Water — On the new flame-hardening machine, flat and V surfaces are hardened simultaneously with a six-torch station. The heating effect of each torch must be carefully regulated since the bed speed is the same for all parts of the ways. The heating effect is controlled by varying the intensity of the flame, its distance from the surface being heated, or by varying both.

Torch design is simple, comprising a flame zone followed by a water jet in the same unit. The water not only cools the torch tips, but quenches the heated piece to produce desired hardness.

Investigation with a Shore scleroscope shows and average rating of 70 to 80 for hardened lathe bed ways. The average depth of the hardened section is $\frac{1}{8}$-inch.

Variables—In the flame-hardening operation, a lathe bed is placed in position on two independent dollies which operate on rails. A motor-driven screw pulls the bed, at a predetermined speed, under the multiple torch assembly. Properly sized torch units are mounted to cover the ways. Gas flow and torch height are individually regulated to achieve the desired depth of hardening. Water pressure is also carefully controlled to produce a uniform rate of flow.

With the expanded production facilities at Monarch, all manufacturing procedures and departments have been re-aligned on the basis of the lathe components to be built rather than the operations to be performed in building them. Consequently the flame hardening machine and way grinder are installed immediately ahead of the bed set-up department. As each lathe bed is flame hardened, it is ground and sent to the lathe erection floor.



Gearmotors are the most efficient means of speed reduction in the 1 to 75-hp range.

Fewer moving parts mean less maintenance with Life-Line GEARMOTORS

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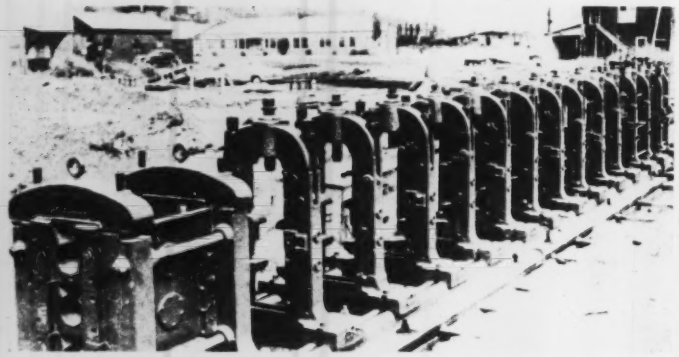
When inspection and servicing are required, Life-Line's split gear housing simplifies the entire procedure. Simply by removing the top half of the gear case, the gears or the motor can be inspected or removed without touching the mounting bolts—without draining the oil—without disturbing the connected load. The complete job takes but a few minutes.

Ask your Westinghouse representative about all the Life-Line Gearmotor features. See why it pays to specify Westinghouse for your speed reduction needs. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-07311

Pacific Northwest Steel Plant in Commercial Operation

Electric furnace now melting carbon steel for 4 x 4-inch billets will shortly be scheduled on alloy and stainless grades. Conversion on new merchant mill to start in 1953

By ROBERT C. HILL
Seattle Correspondent



Housings of 7-stand 10-inch merchant mill installed on their shoe plates

MOST recent Pacific Northwest addition to the area's steel production capacity is the integrated facility of the Seidelhuber Steel Rolling Mill Corp., located on a 20-acre tract on the Duwanish river, Seattle.

Incorporated Feb. 7, 1951, the company began construction of its electric melt plant in June 1951, first steel being poured Jan. 14, 1952. Ingots were sold abroad during the ECA program and in this country primarily to California forging firms. Most subsequent steel production is being stockpiled for conversion in the rolling mill. Other facilities include scrapyard craneway and modern machinery and equipment for both rail and water shipment. Ocean going vessels can be accommodated at the company's berth on the Duwanish river.

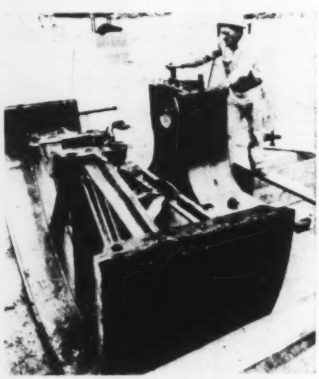
More Coming—A 25-ton Lectromelt furnace is employed at present for the production of electric steel, the annual capacity of the melt shop being 60,000 tons. Plans for increased facilities and larger production include a 70-ton electric furnace which will increase the company's electric steel capacity to 200,000 tons a year. Also planned are a strip mill, pipe mill, cold finishing and annealing facilities. Total plant investment will be approximately $7 million. Completion of the enlarged facilities is scheduled by 1955.

Into Action—Latest unit of this modern plant to go into operation is a 7-stand 10-inch merchant train which was completed in early October. After many weeks of trial runs, during which adjustments were made and personnel trained, the mill began rolling on a 2-shift basis the last week in November; by the end of this year the mill is scheduled to be rolling three turns daily.

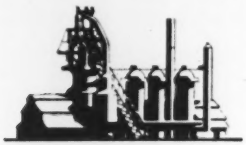
Current production consists of 4 x 4-inch round cornered carbon steel billets. As soon as alloying inventories are built-up, and special steel conditioning equipment is installed, the company will direct its major emphasis on the production of high-quality alloy and stainless steel—a steel market heretofore served mostly by eastern producers.

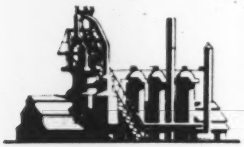
Growth Plan—The next step in the company's proposed construction program is the installation of additional roll stands to permit the conversion of billets to merchant bar sizes. Major units including the roll and pinion stands, a 1200-hp gear reduction set, mill tables, a 1000-hp motor and controls are on the site and will be ready for operating schedules early in 1953.

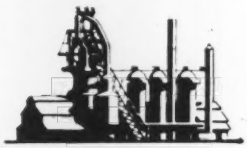
Seidelhuber Steel Rolling Mill Corp. is the outgrowth of Seidelhuber Iron & Bronze Works Inc.,

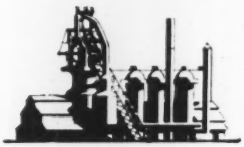


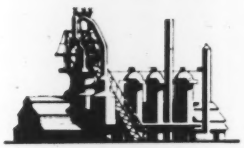
Portion of the flywheel and the bearing block during the state of assembly

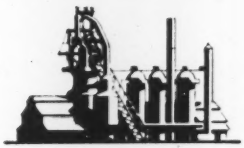


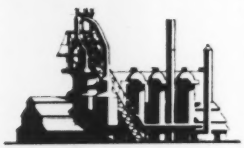












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District Engineering Offices: Union, New Jersey and Tulsa, Oklahoma.

Heat Treating Becomes More Automatic

Three new heat treating furnaces installed by Kropp Forge Co. are capable of more than doubling the firm's production on many forgings. The furnaces are completely automatic, have rated capacity of more than 4000 pounds of steel per hour compared with about 2000 pounds for the old units. Automatic cooling equipment makes it possible to test forgings as they are taken from the furnace

established in Seattle in 1906. The firm has had substantial success in the manufacture of electric water heaters and other items and its name is well known in metal fabricating and manufacturing circles in the western states.

For years, principally in the last decade, Seidelhuber has been handicapped by the shortage of steel items essential to its manufacturing processes. Eastern and southern mills were unable satisfy the demand in this area.

Consequently, in order to maintain a minimum working inventory, Seidelhuber Iron & Bronze Works was obliged to buy materials in foreign markets, principally Germany, Japan, Belgium, France and Luxemburg. After surveying the situation the officials of the company decided to enter the steel manufacturing industry in the Pacific Northwest; hence the new melt shop and rolling facilities.

Solder Paste Is Painted On

A paint-on solder paste combined with flux, called Eutec-TinWeld, increases speed of application while cutting waste to a minimum, according to Eutectic Welding Alloys Corp., Flushing, N. Y.

Basically, TinWeld consists of a specially formulated lead-tin solder that is premixed, in paste form, in proper proportions with its accompanying flux. The product is said to yield a capillary flow similar to silver solder with strengths equivalent to conventional lead-tin solders.

Alloy Adds Life to Sheet Roles

Sheet metal conveyor rolls, made of a new high temperature alloy, have given over 2800 hours of service in an annealing furnace with little sign of erosion or deformation, according to Haynes Stellite Co., Kokomo, Ind., division of Union Carbide and Carbon Corp. Called Hastelloy alloy X, it is subjected to both thermal and mechanical shock from the cold metal sheets.

Rollers were fabricated from sheets of the alloy, 3/16-inch thick. These were formed into shells 7½ inches diameter and 6 feet long, then slipped over 2-inch water-cooled pipe. Space between shell and shaft was packed with refractory material and shaft spiders used to keep shell concentric.

Although these particular rollers were designed to support weights up to 350 pounds, rollers can be similarly fabricated to meet higher weight requirements.

CALENDAR
OF MEETINGS

January 8-9, Midwest Research Institute: Symposium on industrial applications of automatic computing equipment. Hotel President, Kansas City, Mo. Institute address: 4049 Pennsylvania Ave., Kansas City, Mo.

January 11-13, Institute of Scrap Iron & Steel: Annual meeting. Hotel Commodore, New York. Institute address: 1729 H St. NW, Washington 6. Executive vice president: Edwin C. Barringer.

January 12-13, Industrial Furnace Manufacturers Association: Winter meeting. Hotel Cleveland, Cleveland. Association address: 420 Lexington Ave., New York.

January 12-15, American Management Association: Midwinter general management conference. Hotel Statler, Los Angeles. Association address: 330 W. 42nd St., New York 36. Information: Donald F. Keen.

January 12-16, Society of Automotive Engineers: Annual meeting and engineering display. Hotel Sheraton-Cadillac, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

January 13, Mining & Metallurgical Society of America: Annual meeting. Mining Club, New York. Society address: 11 Broadway, N. Y. Secretary: Lt. Col. Donald M. White.

January 15-16, National Industrial Conference Board: General Session, Hotel Astor, New York. Address: 247 Park Ave., New York 17. Secretary: Clyde L. Rogers.

January 15-17, National Tool & Die Manufacturers Association: Winter quarterly meeting. Sorrento hotel, Miami Beach, Fla. Association address: 907 Public Square Bldg., Cleveland. Secretary: George S. Eaton.

January 19-22, Plant Maintenance Conference: Cleveland Public Auditorium, Cleveland. Managers: Clapp & Poliak Inc., 341 Madison Ave., New York 17.

January 19-23, American Institute of Electrical Engineers: Winter general meeting. Hotel Statler, New York. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

January 20, Cutting Tool Manufacturers Association: Annual meeting. Hotel Statler, Detroit. Association address: 416 Penobscot Bldg., Detroit. Secretary: Emil Gairing.

January 20-22, Caster & Floor Truck Manufacturers Association: Winter meeting. Roosevelt hotel, New York. Association address: 27 E. Monroe, Chicago. Secretary: H. P. Dolan.

January 21-22, Steel Shipping Container Institute Inc.: Winter meeting. Pierre & Hampshire House, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

January 22, American Coke & Coal Chemicals Institute: Regional meeting. Edgewater Beach hotel, Chicago. Institute address: 711 14th St. NW, Washington 5. Executive Secretary: Samuel Weiss.

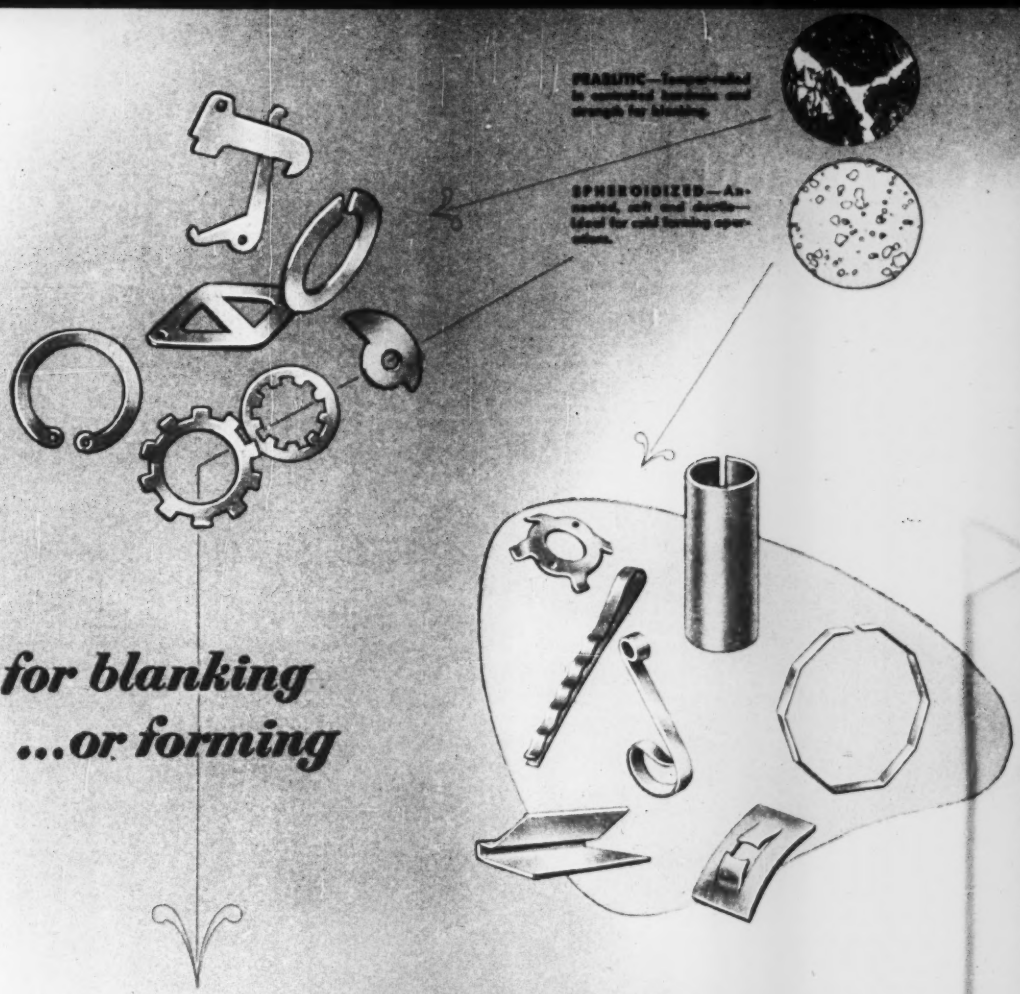
January 22-23, Steel Plate Fabricators Association: Annual meeting. Palmer House, Chicago. Association address: 37 W. Van Buren St., Chicago. Secretary: Dwight Evans.

January 23, Malleable Founders' Society: General meeting. Hotel Cleveland, Cleveland. Society address: Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

January 26-28, Truck-Trailer Manufacturers Association: Annual meeting. Edgewater Gulf hotel, Edgewater Park, Miss. Association address: 1024 National Press Bldg., Washington. Managing director: John B. Hulse.

January 26-30, American Society of Heating & Ventilating Engineers: International heating and ventilating exposition. Grand Central Palace, New York. Society address: 51 Madison Ave., New York 10. Secretary: A. V. Hutchinson.

February 16-19, American Institute of Mining & Metallurgical Engineers: Annual meeting. Hotel Statler, Los Angeles. Institute address: 29 W. 39th St., New York 18. Secretary: E. H. Roble.


PEARLITIC—Temperedized to maximum hardness and strength for blanking.
SPHEROIDIZED—Annealed, soft and ductile—ideal for cold forming operations.

for blanking ...or forming

it's easier when you use WEIRTON HIGH-CARBON STRIP COLD-ROLLED SPRING STEEL

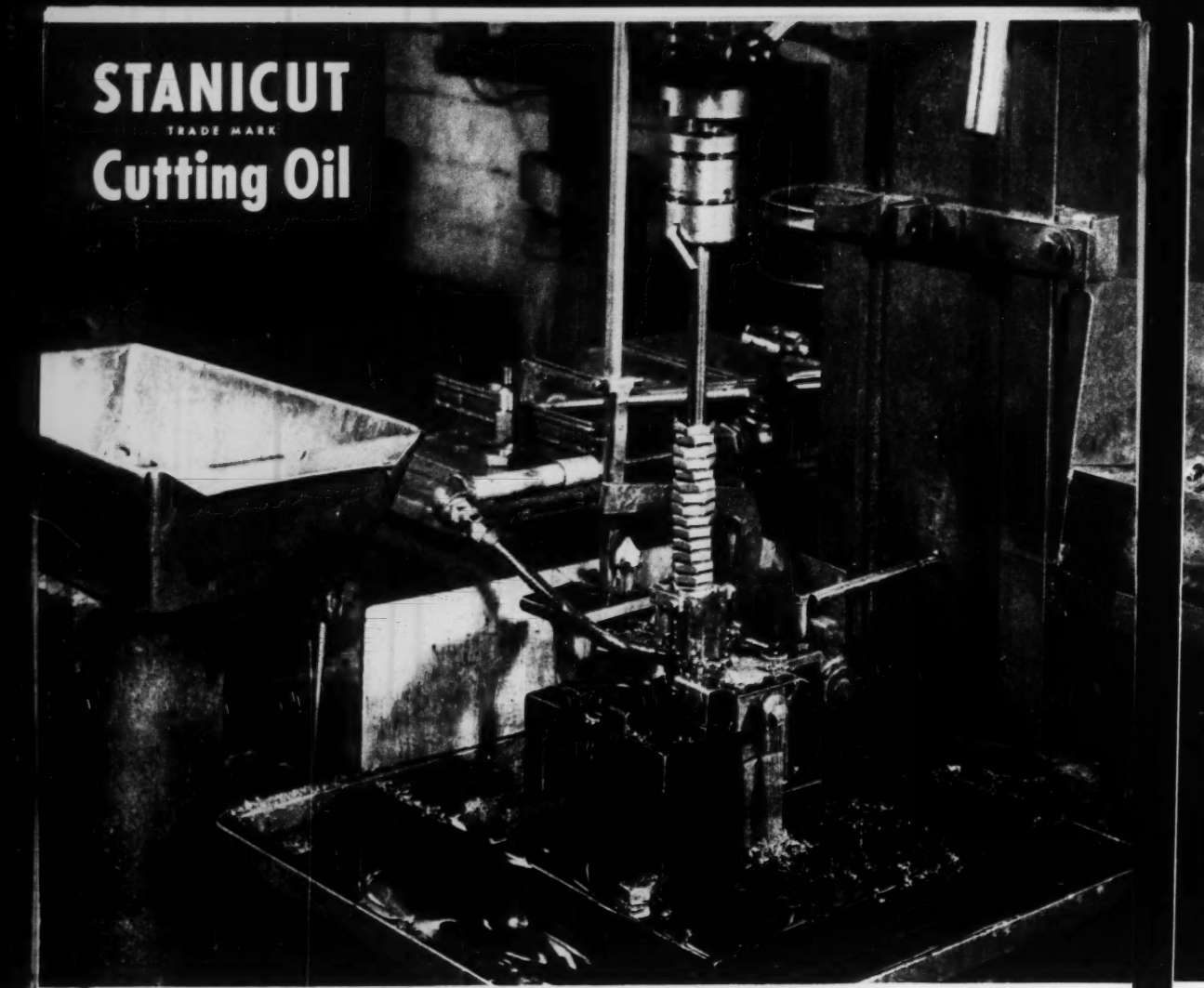
Either for blanking or for forming, there is a Weirton cold-rolled spring steel having special qualities and properties that make the operation easier to perform and make the manufactured product better. You will always get consistent results, too—because Weirton's close control over every step of manufacture assures constant uniformity.

You can count on Weirton High-Carbon Strip cold-rolled spring steel . . . for accurate response to heat treatment —uniformity of gauge and width—uniform chemical and physical properties—exact constancy of grain structure —controlled decarburization limits.

Weirton High-Carbon Strip is obtainable with the desired chemical analysis and for specific heat treating and hardness ranges, in widths up to seven inches.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION



Tapping problem solved; production boosted 25%

● A midwest manufacturer was having trouble with a thread tapping operation. Performed on the drill press shown above, the job called for the tapping of a $\frac{3}{4}$-inch threaded hole in nuts made from C-1018 steel stock. The quality of threads tapped was poor. Rejections ran high because of torn threads.

Consulted on this problem, a Standard Oil lubrication specialist recommended the use of STANICUT Cutting Oil 309 BCS. Replacing a conventional cutting fluid, STANICUT turned the tide on troubles. With its use, quality of threads has been excellent. Rejections have been reduced to a minimum. Production has been boosted 25% — an increase of approximately 100 pieces per hour!

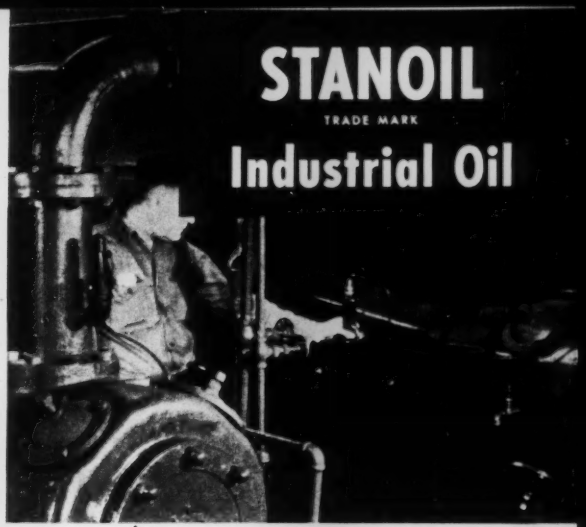
Whatever your cutting oil problem, the Standard Oil lubrication specialist in your section of the Midwest can help you solve it. Backed by one of the most complete lines of cutting oils on the market, he has the training and experience to apply those products most effectively. You can contact him by phoning your local Standard Oil (Indiana) office. Or write: Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

What's YOUR problem?

D. F. Wallace of the Standard Oil office in Saginaw, Michigan, is the lubrication specialist who helped this midwest manufacturer solve a serious problem through the use of STANICUT Cutting Oil.

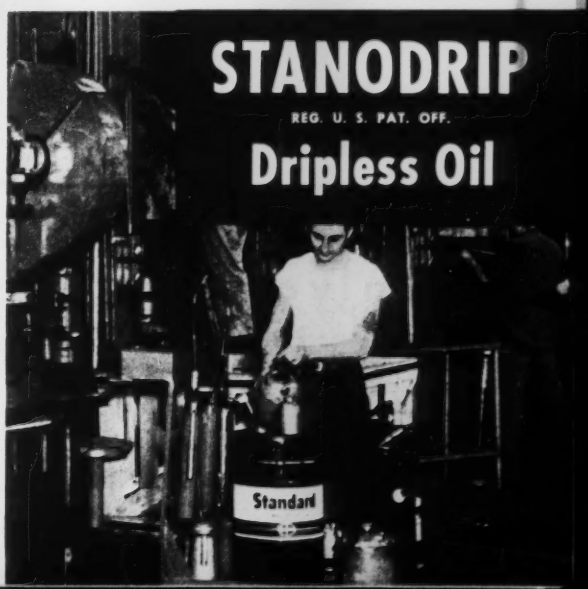
Like all Standard Oil lubrication specialists, he has a broad background of practical experience plus thorough training in Standard's own schools. And like all lubrication specialists, his on-the-job help is always available. He is one of a corps of experienced men who make their headquarters wherever industry is located throughout the Midwest.

For help with your problem, call for the services of your Standard Oil lubrication specialist today! A call to your local Standard Oil office is all that's necessary.



Compressors give carbon the air. Hayes Industries, Jackson, Michigan, had air compressor trouble caused by formation of carbon on valves. With the change to STANOIL Industrial Oil, compressors gave the air to carbon troubles and have breezed through four years of hard operation without difficulty. Over the oil previously used, STANOIL has given four times longer service in crankcases.

No drips in this press room. STANODRIP Dripless Oil solved a press room lubrication problem at A. O. Smith Corporation Kankakee Works. It put a stop to drippage of oil from bearings on stamping and punch presses. Results: cleaner and safer working conditions, less lubricant consumption, fewer applications of lubricant.



STANDARD

STANDARD OIL COMPANY
(INDIANA)

Iron and Steel *need protection too!*

If it's made of iron or steel,
and exposed to the elements,
remember to have it
Hot-Dip Galvanized—*sealed in zinc!*

HANLON-GREGORY
Galvanizing Company

Pittsburgh . . . Pennsylvania
The World's Largest Job Galvanizing Plant
A. J. DIEBOLD, President

in the heart of the STEEL INDUSTRY

galvanizing . . . . pickling . . . . painting . . . . oiling

NEW PRODUCTS and equipment

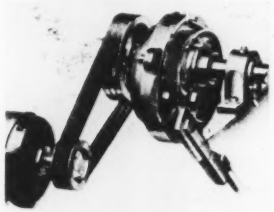
Reply cards on page 101 will bring you more information on any new products and equipment in this issue

Shaft-Mounted Speed Reducer

. . . single, helical type gearing

Series of 20:1 speed-reduction units features improvement in gears, bearings, housing, lubrication and oil sealing systems. Gearing in the Shaft-King model reducer consists of two single-helical type trains. Gears are precision-cut from alloy steel forgings and flame-hardened.

Both ball and tapered roller bearings are used where each can



be employed most effectively. Longer bearing and gear life is reported by use of three-wall housing. Interchangeable split tapered bushings with locking nuts are said to eliminate fretting-corrosion and make the unit immediately adaptable to any shaft size through 3 7/8 inches. American Pulley Co., Dept. ST, 4200 Wissahickon Ave., Philadelphia 29, Pa.

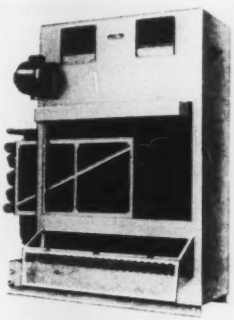
USE REPLY CARD—CIRCLE No. 1

Evaporative Condenser Line

. . . capacities: 7½ to 40 tons

Building block construction and removable sectional components are design features of an evaporative condenser line that provide flexibility of arrangement and complete accessibility. Marketed as model ECU, equipment is produced in six sizes with capacities from 7½ to 40 tons. Unit can be disassembled and reset in any of sixteen different arrangements to meet specific installation requirements.

Cooling is accomplished by evaporation of sprayed water moving



in counterflow to large volumes of air. Only 5 per cent of the water is lost through evaporation, the remainder is recirculated. U. S. Air Conditioning Corp., Dept. ST, 3300 Como Ave. SE, Minneapolis 14, Minn.

USE REPLY CARD—CIRCLE No. 2

Limit Switch

. . . made in four types

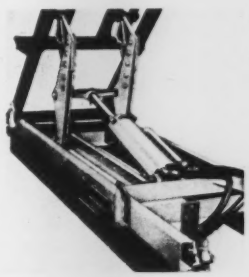
The "du-op" limit switch is now available with four new types of actuators. Type DU-O is operated by a heavy duty ⅛-inch diameter nylon plunger; type DU-L is a sensitive leaf actuator requiring very light operating pressures and may be set to any of three leverage positions; type DU-B may be actuated from side or at any lesser angle by a ball serving as actuator, located in top of single hole mounting stud; type DU-E, provides for plunger over-travel of up to 0.093-inch and consists of a stainless steel plunger and steel actuator housing. General Control Co., Dept. ST, Boston 34, Mass.

USE REPLY CARD—CIRCLE No. 3

Redesigned Hydraulic Hoist

. . . truck range broadened

Redesign of this hydraulic hoist makes it suitable for installation in a wider truck range. Model 770 has load capacity from 10 to 13 tons, weighs 950 pounds. It features all-steel subframe, cast steel



rear hinges and forged steel crosshead.

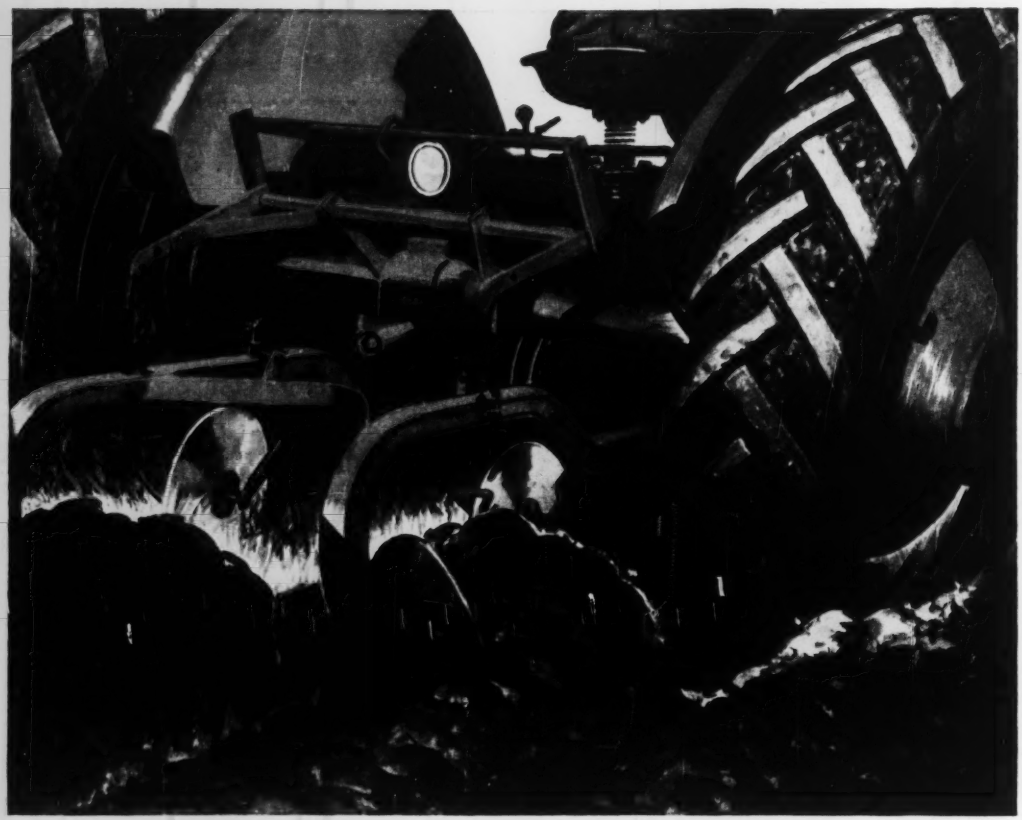
Hoist has 50-degree dump angle, 14¾-inch mounting height. It is recommended for use on 8 to 12-foot dump bodies. Galion Allsteel Body Co., Dept. ST, Galion, O.

USE REPLY CARD—CIRCLE No. 4

Photoelectric Unit

. . . for plate circuit control

Actuation of electric counters and other devices directly in the plate circuit is provided by the improved Shadowswitch. Amplifier is preadjusted to maximum sensitivity; adjustments for spe-



Metal Muscles for Modern Farmers

Push-button farming — with hydraulic tubular steel cylinders replacing weaker, less efficient human muscles — is but one of the many opportunities for improving design of plows, planters, drills, mowers, cultivators and other farm equipment, with OSTUCO Tubing.

Designers and engineers in the farm equipment industry, like those in many other fields, are finding OSTUCO Tubing ideal for cylinders, levers, handles, fuel lines, axles, spacers, bushings, bearings, and exhaust parts, to mention but a few of the applications.

They like OSTUCO Tubing for flexibility in design, great strength, light weight, good machinability, smooth finish, high quality, low cost.

We cannot always promise early delivery estimates on new civilian orders, because of military demands, but it will pay you to consult our experienced engineers about OSTUCO Tubing when redesigning your products to meet future competition.

From Your Blueprint . . . to Your Product
OSTUCO TUBING
Tapering • Swaging • Flanging • Bending
Upsetting • Expanding • Reducing • Beading
End closing • Spinning • Drilling • Slotting
Notching • Flattening • Shaping • Trimming
Threading • Angle Cutting • And Many Others

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Manufacturers and Fabricators of Seamless and Electric Welded Steel Tubing

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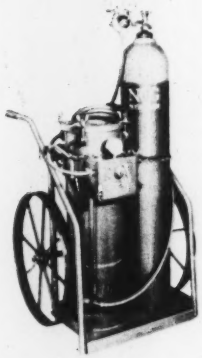
cific applications are made with the light beam which can be focused for interruption by objects as small as 3/16-inch diameter. Autotron Co., Dept. ST, Box 722-66, Danville, Ill.

USE REPLY CARD—CIRCLE No. 5

Powder-Cutting Equipment

. . . makes powder flow uniform

Powder dispensing unit used for cutting stainless and other hard-to-cut steels is improved to gain greater uniformity of flow. Powder regulating and ejecting mechanisms are redesigned, the model is



simplified and made more compact, and is easily portable.

Gas pressure and rate of powder flow are maintained automatically by the dispensing unit. Powder control valve is also automatic, operating simultaneously as oxygen valve on the torch is turned on and shut off. Both machine and hand-cutting torches are available. For use in foundries, a flame washing torch is available for quick removal of riser pads, fins, etc. from castings. National Cylinder Gas Co., Dept. ST, 840 N. Michigan Ave., Chicago 11, Ill.

USE REPLY CARD—CIRCLE No. 6

Ratchet Wrenches

. . . stop socket in open position

Open end pneumatic ratchet wrenches have design which stops the socket positively in open position. A stop plate is built into the side plate of the wrench. When operator's thumb is pushed against this plate, it moves forward and engages a pin in the socket, which automatically stops it in open position. Wrenches are made in two sizes capable of handling hex nuts ranging from 3/8 to 3/4-inch across flats. Keller Tool Co., Dept. ST, Grand Haven, Mich.

USE REPLY CARD—CIRCLE No. 7

Furnace Atmosphere Control

. . . carbon control is automatic

Proportioning instrument automatically controls and records carbon potential of furnace atmosphere. It enables the heat treater to set atmosphere or furnace in equilibrium with any steel. Control unit, called the Carbotrol, works on the principle of detecting and con-

trolling moisture content, which directly controls carbon potential.

Sensing unit that determines percentage of moisture functions on a principle that eliminates use of refrigeration or pressure chambers and is independent of the ambient temperature of the heat treating room. Recording and controlling unit is a standard electronic strip chart instrument. Lindberg Engineering Co., Dept. ST, 2450 W. Hubbard St., Chicago 12, Ill.

USE REPLY CARD—CIRCLE No. 8

Electric Heating Unit

. . . resists corrosive action

CTL immersion type electric heating unit for electroplating baths has a thick lead sheath that resists corrosive acid action of copper, chrome and nickel solutions. It is rated at 5 kw on 230 v. Terminals are protected by a moisture tight, cast iron housing. Edwin L. Wiegand Co., Dept. ST, 7579 Thomas Blvd., Pittsburgh 8, Pa.

USE REPLY CARD—CIRCLE No. 9

Hydraulic Lift Stacker

. . . maximum height: 58 inches

Hydraulic stacker lifts 1/4-ton loads to maximum 58-inch elevation. Foot pedal raises load, with-

out vibration, by hand-powered hydraulic lift.

Minimum fork height is 4 inches; overall width, 24 inches. Forks are 27 inches long. Swivel casters and adjustable forks are standard. Port-A-Lift Co., Dept. ST, 2998 N. Euclid Ave., Bay City, Mich.

USE REPLY CARD—CIRCLE No. 10

Coil Spring

. . . utilizes fluid compressibility

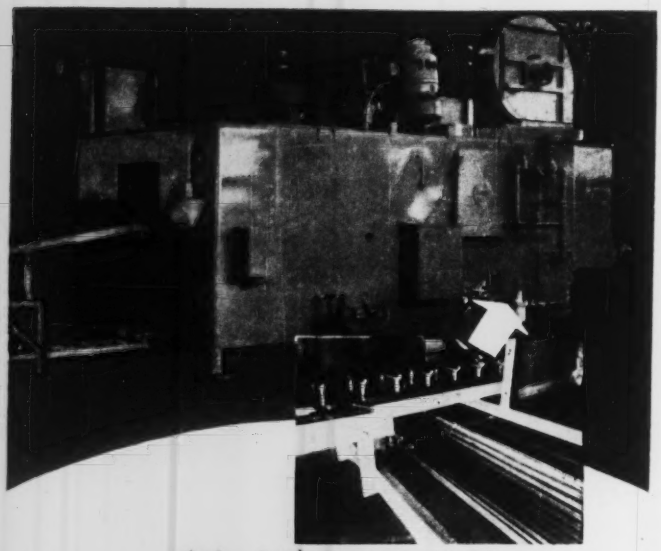
Hydra-Spring utilizes the compressibility of a special fluid called Comproil. It makes possible die operations that were previously impossible. Stripping pressures may be adjusted by adding or reducing the volume of fluid which also provides a resilient action. Wales-Strippit Corp., Dept. ST, 345 Payne Ave., N. Tonawanda, N. Y.

USE REPLY CARD—CIRCLE No. 11

Turbine Wheel Chucks

. . . no distortion or strain

Large turbine wheels and jet engine disks and rings can be machined safety without distortion or strain. Chucks meet require-



use of **PLATECOILS** gives
CENTRI-SPRAY WASHING MACHINES construction and sales advantages

In building several of these motor block washers for a large automobile manufacturer, Centri-Spray, Inc., Detroit, Michigan has found that the use of Platecoils has 6 important advantages.

1 Higher heat input per cubic foot for quicker heat-up.

2 Easier installation with Platecoil banks.

3 At least 90% of threaded pipe joints eliminated to reduce leakage problems.

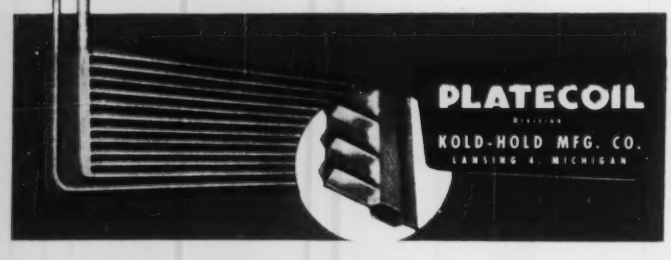
4 Longer service without cleaning.

5 Less condensate trapping in Platecoil bank as compared with serpentine pipe coil.

6 No wire cutting in return bends through much lower steam and condensate velocity.

A bank of three 18 x 84 Platecoils is used instead of a pipe coil consisting of 42 pieces of one inch pipe 85" long, and two pieces 87" long. In addition 44 return bends were needed plus the straps and separate tie bars required. Use of the Platecoils not only simplifies fabrication for Centri-Spray, but it also gives their customer a more efficient, dependable washer.

Why not investigate using Platecoils in your products? You will find, as other manufacturers have, that Platecoils save time in estimating . . . that Platecoils save time and labor in fabrication . . . and that customers are better satisfied with Platecoil performance. **Write today for Bulletin P72.**



NEW PRODUCTS and equipment

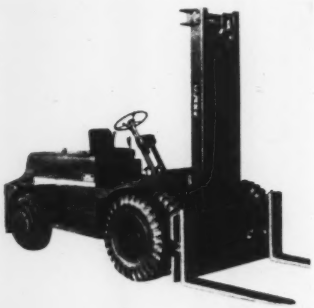
ments for holding large workpieces with small cross section rigidly without distortion, strain or harmonic vibration. Units can be furnished on special order for manual chucking or air power operation in repetitive machining. Cushman Chuck Co., Dept. ST, Hartford 2, Conn.

USE REPLY CARD—CIRCLE No. 12

Heavy-Duty High-Tiering Truck

. . . works on tough outdoor jobs

This gas-powered, pneumatic-tired Yardlift-100 truck has 10,000-pound capacity at 24-inch load center. It is built for heavy-duty high-



tiering work under difficult outdoor conditions.

Model is powered by a Continental engine producing 55 brake horsepower at 2000 rpm. Traveling speed is 17.8 mph. Hydraulic steering is standard; turning radius is 133 inches. Industrial Truck Division, Clark Equipment Co., Dept. ST, Battle Creek, Mich.

USE REPLY CARD—CIRCLE No. 13

Metal Treating Furnace

. . . takes 400 pounds per hour

This automatic heat treating unit features 100 per cent forced convection heating. The furnace operates at temperatures to 1850° F, has complete automatic straight-through operation from heat through cooling or oil quench. It takes work at a rate of 400 pounds per hour.

Proper sealing provides absolute atmosphere control during entire heating and quench cycle, assur-

to avoid trouble - don't invite it!

One way to avoid costly machine tool breakdowns and down-time is to head off the trouble before it starts—with a positive preventive maintenance program.

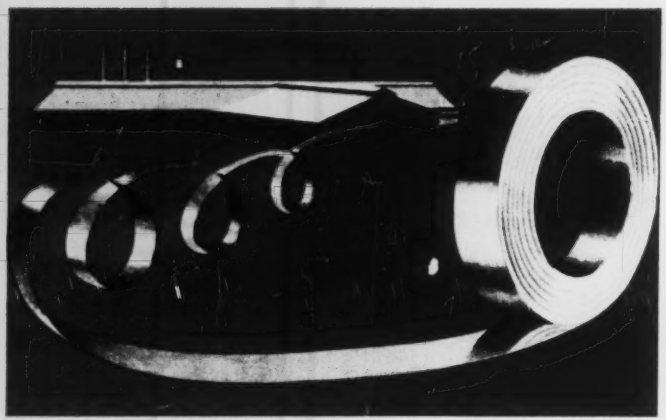
Another way—and an important one—buy the machine that is backed by an industry-wide reputation for long years of trouble-free service.

When the going gets tough—put it on the Warner & Swasey!

WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

FOLLANSBEE
COLD ROLLED STRIP
FOR
CUSTOM-QUALITY
WITH CUSTOM-SERVICE



For your strip requirements for any type of production—specialty or run-of-mill—you may use Follansbee Cold Rolled Strip with complete assurance. It is rolled, tempered and supplied to your specifications. Follansbee Cold Rolled Strip provides a continuous supply of uniform steel from coils to your automatics, regardless of forming operations involved.

Follansbee Steel Corporation is set up to supply you with quick, direct, personalized service.

Consult your trained Follansbee Steel representative. He will be glad to discuss your fabricating problems with you.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

POLISHED BLUE SHEETS AND COILS SEAMLESS TERNE ROLL ROOFING
COLD ROLLED STRIP

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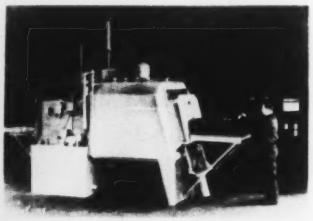
FOLLANSBEE METAL WAREHOUSES

Pittsburgh, Pa. Rochester, N.Y. Fairfield, Conn.

NEW PRODUCTS and equipment

ing bright, scale-free work. Straight-through design saves handling time and loading delays. Work is loaded directly into the heating zone, then tray is transferred automatically onto a quench-cool rack. This holds load for atmosphere cooling or lowers it for oil quench. Ipsen Industries Inc., Dept. ST, 715 S. Main St., Rockford, Ill.

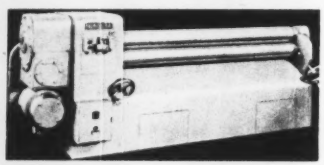


USE REPLY CARD—CIRCLE No. 14

All-Steel Bending Rolls

. . . roll wide cylinder range

Series of all-steel bending rolls produce commercially true cylinders from thinnest sheets to maximum capacity. In addition, they can roll a multitude of bends in various shapes, including oval forms, rectangular pipes, rounded end containers and cones.



Pinch type construction reduces flat spots on leading and trailing edges of work. Because all three rolls are power driven, light-gage sheets can be formed readily into small diameters. Upper roll tilts automatically for easy removal of

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

70. Oil Hydraulic Equipment

Superdraulic Corp. — Engineering details, cross-sectional drawings and other data on hydraulic pumps, pressure controls, four-way valves, check valves, special valves and cylinders, positive remote control, motors, transmissions, power units and test stands are included in 2-page illustrated catalog.

71. Press Brakes

Struthers Wells Corp. — Press brakes in 100 to 500-ton capacities and 4 to 22-ft sizes are subject of 8-page bulletin P-752. Tabulated specifications and dimensions are given on presses which form up to 7/8-in. thick mild steel plate. Bending, blanking, corrugating, shearing, drawing, forming, punching and trimming are applications.

72. Pipe Thread Standards

Eastern Machine Screw Corp. — "American National Pipe Threads" is title of 6-page illustrated folder that deals with different types of taper and straight pipe threads and gives designation letters by which these threads are specified.

73. Roller Chain

Link-Belt Co. — In 148 pages of roller chain engineering data book No. 2457 you will find data covering the selection, installation, lubrication and maintenance of roller chain for drives and conveyors, and sprocket wheels. Many photos and line drawings are included, as are formulas, charts, diagrams and typical problems to simplify selection.

74. Power Walkie Type Trucks

Moto-Truc Co. — There's a size and type of motorized battery-operated walkie type industrial truck for practically every need involving materials handling of loads weighing up to 10,000 lb. Standard models detailed in 6-page illustrated bulletin 51 include standard and shortie pallet lift models, platform lift types, standard and push-pull tractors, standard and high-lift fork trucks and ride types.

75. Cleated Belt Conveyor

Rapids-Standard Co. — Drawings, photos and specifications of a wide range of Press-Veyor, Jr., cleated belt conveyor models for handling of metal stampings, screw machine products, scrap and similar materials are to be found in 4-page bulletin LPV-52. Construction details are outlined.

76. Dust Control

Dracco Corp. — 40-page well illustrated bulletin No. 800 pictures and describes with specifications, features, construction and operating data line of equipment for dust control and recovery. Units covered are Multi-Bag Uni-filters, Dustomatic and DH filters and Whirl-Clones, made in styles and sizes for every job requirement. Typical applications are shown.

77. Screw Pumps

Sier-Bath Gear & Pump Co. — Single reply sheet which can be filled out and sent in to company by prospective buyer lists features and advantages of line of screw pumps. Units for handling nonlubricating fluids, abrasive materials, high viscosity solutions and lubricating fluids at from 1 to 700 gpm discharge are covered.

78. Vending Displays

Hinde & Dauch Paper Co. — "How to Select Vending Displays That Increase Sales" is title of pocket-size issue No. 10 of the "Little Packaging Library." Booklet pictures and describes numerous Selmor merchandise displays made of corrugated fiberboard designed to place a substantial supply of a given product on the buyer's side of the store counter.

STEEL
Penton Building, Cleveland 13, Ohio

12-29-52

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PRODUCTS MANUFACTURED

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Readers Service Dept.

79. Needle Bearings

Roller Bearing Co. of America—General design data, sectional drawings and specifications for line of Pitchign spaced and aligned needle bearings are contained in 16-page engineering bulletin SF-66. Typical applications are shown, and life probability and load speed curve graphs are included.

80. Direct-Fired Heating Unit

Pratt-Daniel Corp.—You'll find specifications, dimensions and line drawings for line of Thermobloc direct-fired heating units in 8-page illustrated catalog NGC-10-52. Also, a full color cutaway illustration of a unit and a list of construction features are included.

81. Self-Locking Fasteners

Elastic Stop Nut Corp. of America—Case histories and the latest engineering data on Rollpin self-locking fasteners are features of 16-page illustrated catalog 800. Charts and tables specify insertion and removal forces in steel for various Rollpin diameters and lengths. Effect of material hardness, comparative hole tolerances and other data are included.

82. Chaser Sharpener

Jones & Lamson Machine Co.—8-page illustrated catalog No. 503 is descriptive of the new universal bench type chaser sharpening machine. Wide range of adapters for various types of chasers is also shown. Operation and design are discussed.

83. Cranes

Orton Crane & Shovel Co.—4-page illustrated bulletin 83 explains features of Torque Control cranes which utilize the GM Allison torque converter for smooth application of power. Also available to technical men is 20-page reprint of article from "Machine Design" entitled "Applying Torque Converters to Crane Drives."

84. Turbine Blade Machines

Niles-Bement-Pond Co., Pratt & Whitney Div.—Application of Pratt & Whitney grinders to the manufacture of turbine blade airfoils is outlined in 6-page illustrated folder 551. Details of the operation, general data and complete specifications are given.

85. Infrared Heating & Drying

Fostoria Pressed Steel Corp.—20-page illustrated technical bulletin "How Thousands of Plants Cut Costs" presents advantages of infrared processes for baking, drying, dehydrating, preheating, degreasing and other industrial applications. Available equipment and typical applications of infrared lamp type ovens and panels are described.

86. Splashproof Motors

Elliott Co.—Complete line of outdoor splashproof weather-protected Fabri-Steel induction motors ranging in size from 250 to 4000 hp in two-pole designs and 50 to 3000 hp in 4 to 14-pole types are described in 4-page illustrated bulletin PB-7000-3.

EDITORIAL REPRINTS:

87. Mass Production

Using a combination of automatic machines, GM's Rochester Products Div. has kept their production of zinc die cast carburetor components for Chevrolets in step with heavy demand. Machines are versatile and are used on different parts. Their operation in turning out these parts is described in STEEL reprint "Mass Production: But with an Eye on Versatility" by H. Chase.

88. Hand Motion Studies

University of Wisconsin psychologists are using electronic devices to study the various hand or body motions that go into simple and complex tasks. Some interesting findings are reported in STEEL reprint "Electronics Helps Industry Planners" by Prof. K. U. Smith, director of this project.

89. Titanium Forging

Behavior of titanium isn't like that of other forging material, but pieces are being formed in variety of sizes, and jobs are handled on various types of forming equipment. R. J. Bullock, Wyman-Gordon Co. development engineer, reviews some of the accumulated experience with this metal in STEEL reprint "Titanium Forging Experience Mounts."

90. Carbide Grinding Training

STEEL reprint headlined "Customer School Trains Carbide Specialists" pictorially follows a student through an intensive course in the use of cemented carbides conducted by G-E's Carboloy Dept. Students are key supervisors sent at their company's expense. Course covers single point carbide tool design, torch brazing, grinding, machine applications and trouble shooting, and tool handling.

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rolled cylinder. Rolls are made in three sizes: $\frac{1}{16}$ x 48 inches; $\frac{1}{8}$ x 72 inches; and 12-gage by 120 inches. Niagara Machine & Tool Works, Dept. ST, 637-697 Northland Ave., Buffalo 11, N. Y.

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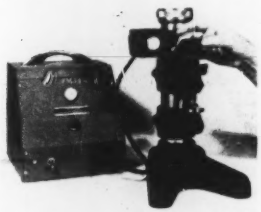

screw. An electronic circuit, sensitive to five millionths-inch displacement at the micrometer tip gives visual indication at moment of contact but before pressure is exerted. J. W. Dice Co., Dept. ST, Englewood, N. J.

USE REPLY CARD—CIRCLE No. 16

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Type SC shallow surface luminaire is 3 5/16-inch deep. It is available in 4, 6 or 8-foot lengths and two and four lamp widths. Luminaire can be used with a variety of slimline and standard fluorescent lamps. Hinge down louvers provide 35 degree shielding both crosswise and endwise. Westinghouse Electric Corp., Dept. ST, P. O. Box 2099, Pittsburgh 30, Pa.

USE REPLY CARD—CIRCLE No. 17

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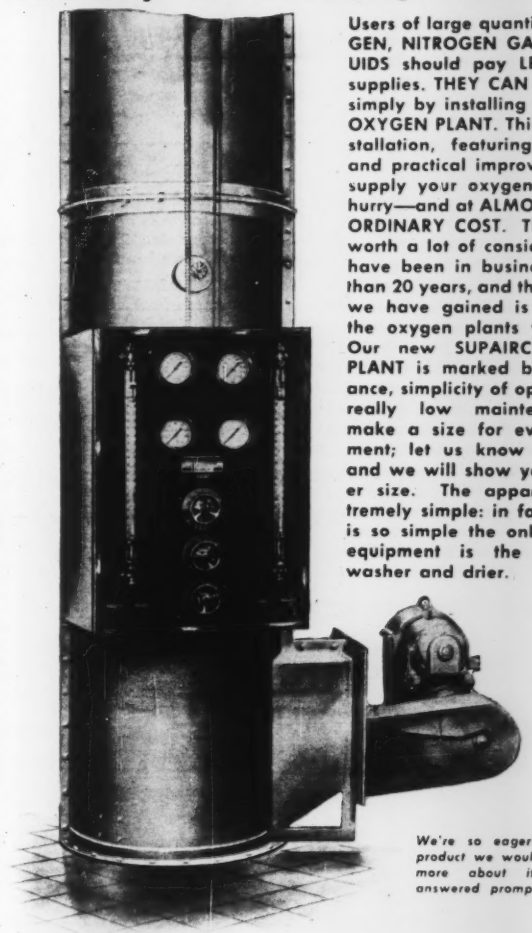

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REPUBLIC STEEL

The Market Outlook

GOOD BUSINESS for the steel industry for the first half of 1953 is "in the bag."

With that period no longer a worry, analysts are concerning themselves now with the outlook for the last half. Where once there was considerable apprehension about the last half, there's now a growing inclination toward optimism. With the first half shaping up so well, they feel the last half just can't fall to pieces.

A LOOK AHEAD—Some of the analysts, however, don't feel certain that the steel industry will need to run at 100 per cent of capacity throughout the year to fill the demand for steel. They're now thinking that the 1953 steel ingot output will be around 105 million net tons. We'll go into the new year with around 116 million net tons of capacity, and as the year progresses it will grow to around 120 million tons. Production of 105 million ingot tons would require an average operating rate of approximately 90 per cent. That would be 4 points above the 1952 average. Part of the time in 1952, the industry operated as high as 106 per cent of capacity, but the two-months strike last summer cut the average for the year down to 86.

ENOUGH CAPACITY?—While some of the analysts feel a steelmaking capacity of 120 million tons is more than we will need for the near term once we are caught up from the strike, they think that ultimately 120 million tons will not be too much, may not be enough, in view of the expansion in the country's population.

The 86 per cent average operating rate in 1952 yielded slightly more than 93 million net tons of steel for ingots and castings. This is exceeded by two other years, 1950 and 1951.

REPETITION—As in other recent years, most of the steel made in the U. S. in 1952 went into uses normally regarded civilian.

The defense uses of steel, however, made themselves felt out of proportion to the tonnage involved. They sopped up a large amount of the large carbon bars, heavy carbon plate and nickel-bearing stainless steel.

Reflecting the defense steel needs, two of the three biggest products tonnagewise in 1952 were hot-rolled bars and plates. The other one of the big three was cold-rolled sheets. In a purely peacetime economy, cold-rolled sheets would lead.

Any further easing in steel supply and demand will be just as it has been this year, of a spotty character. Not all products will ease at once and not all geographical areas will be affected alike.

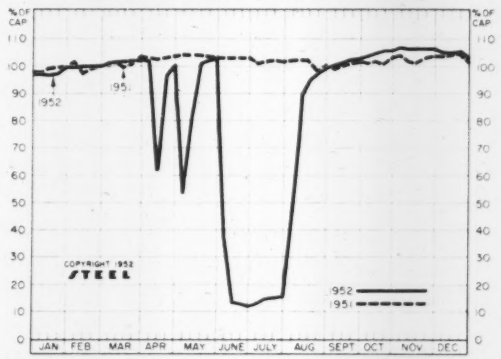
PRICE OUTLOOK—Any amount of easing that may be seen in 1953 is not likely to bring outright reductions in the standard prices on steel. What first would happen is this: Premium prices would disappear; qualities would go up; freight absorption by steel producers would become increasingly prevalent.

While large bars and heavy plates are the garden variety of steel products in tightest supply, there are some runnersup. They are hot-rolled and cold-rolled carbon sheets, seamless tubing, line pipe, wide flange beams and nickel-bearing stainless steels. Much easier than these in supply are small bars, wire, bolts and nuts, tin mill products and merchant pig iron.

PERKING UP—Although merchant pig iron is in sufficient supply, there are indications that demand will pick up soon. Good prospects for business in the first half of 1953 have brightened the outlook for gray iron foundries, users of merchant pig. Foundries already are getting heavier orders for castings, particularly from the appliance industry.

HOLIDAY PAUSE—As if to get a rest before launching into high gear again for the new year, the steel industry lowered its production rate last week during the Christmas holiday. Not only were finishing operations reduced but so was production of the raw steel. Output of steel for ingots and castings is estimated at 103 per cent of capacity. That's a 2.5 point decline from the preceding week.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Dec. 27	Change	Same Week 1951	Same Week 1950
Pittsburgh	102	2*	97	98
Chicago	106.5	1.5*	96.5	100
Mid-Atlantic	95	6	101.5	91
Youngstown	106	0	106	106
Wheeling	98	2	98.5	97
Cleveland	96.5	14*	102.5	94.5
Buffalo	104	2.5	104	104
Birmingham	104	4	104	100
New England	80	0	80	80
Cincinnati	90	3	77	88
St. Louis	88.5	12.5	87	81.5
Detroit	102	1.5*	104.5	103.5
Western	106	2	102	96
Estimated national rate	103	2.5	101.5	98

Based on weekly steelmaking capacity of 2,027,040 tons in 1952; 1,909,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 35 Production-Engineering News—p. 71

Composite Market Averages

FINISHED STEEL PRICE INDEX, Bureau of Labor Statistics	Dec. 23 1952	Dec. 16 1952	Month Ago	November Average
(1947-1949 = 100)	120.6	120.6	120.6	120.6

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Dec. 23, 1952

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$5.275
Track spikes	6.850	Sheets, galv.	6.915
Track bolts	9.958	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.099
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft)	8.887
Structural shapes	4.206	Boiler tubes (100 ft)	31.963
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.675	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.349	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv.	6.458
Bars, reinforcing	4.050	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	5.525	Wire, barbed (80 rod spool)	5.920
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.720

FINISHED PRICE INDEX, Weighted, Calculated by STEEL*

	Dec. 24 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av. = 100)	181.31	181.31	181.31	171.92	129.28
Index in cents per lb	4.912	4.912	4.912	4.657	3.502

ARITHMETICAL PRICE COMPOSITES, Calculated by STEEL*

Finished Steel, NT	$110.98	$110.98	$110.98	$105.32	$76.32
No. 2 Fdry. Pig Iron, GT	55.04	55.04	55.04	52.24	36.89
Basic Pig Iron, GT	54.06	54.06	54.06	52.16	36.31
Malleable Pig Iron, GT	55.72	55.27	55.72	53.27	37.54
Steelmaking Scrap, GT	43.00	43.00	43.00	43.00	29.92

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Dec. 24 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del. Philadelphia	4.502	4.502	4.502	4.223	3.318
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del., Philadelphia	4.13	4.13	4.13	3.918	2.954
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.15	4.15	4.15	4.15	3.40
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	3.40
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.70
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.90
Strip, H.R., Pittsburgh	3.75-4.225	3.75-4.225	3.75-4.225	3.75-4.00	2.80
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.55
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.95	5.30-6.95	5.30-6.05	4.85-5.60	3.70
Wire, Basic, Pittsburgh	5.10-5.225	5.10-5.225	5.10-5.225	4.85-5.10	3.675
Nails, Wire, Pittsburgh	6.20-6.35	6.20-6.35	6.20-6.35	5.90-6.20	4.625
Tin plate, box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$5.75

SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$56.50
Wire rods, $\frac{7}{32}$-$\frac{9}{32}$", Pitts.	4.425	4.425	4.425	4.10-30	3.05

PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$37.00
Basic, Valley	54.50	54.50	54.50	52.00	36.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	38.84
No. 2 Fdry., Pitts.	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry., Chicago	55.00	55.00	55.00	52.50	36.00
No. 2 Fdry., Valley	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry., del. Phila.	59.75	59.75	59.75	57.11	39.34
No. 2 Fdry., Birm.	51.38	51.38	51.38	48.88	34.88
No. 2 Fdry. (Hub.) del. Cin.	58.93	58.93	58.93	55.49	38.74
Malleable, Valley	55.00	55.00	55.00	52.50	36.50
Malleable, Chicago	55.00	55.00	55.00	52.50	36.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	50.00
Ferromanganese, Elna, Pa.	228.00	228.00	228.00	188.00	151.00*

*F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$44.00	$40.00
No. 1 Heavy Melt., E. Pa.	41.50	41.50	41.50	42.50	41.00
No. 1 Heavy Melt., Chicago	42.50	42.50	42.50	42.50	38.75
No. 1 Heavy Melt., Valley	44.00	44.00	44.00	44.00	39.75
No. 1 Heavy Melt., Clevel.	43.00	43.00	43.00	43.00	39.25
No. 1 Heavy Melt., Buffalo	43.00	43.00	43.00	43.00	42.50
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	60.00
No. 1 Cast, Chicago	44.00	44.00	44.00	48.00	63.00

†F.o.b. shipping point.

COKE, Net Ton					
Beehive, Furn., Connlsv.	$14.75	$14.75	$14.75	$14.75	$12.00-12.50
Beehive, Fdry., Connlsv.	17.00	17.00	17.00	17.50	14.00-15.00
Oven, Fdry., Chicago	24.50	24.50	24.50	23.00	17.60

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$56.50	$57.00	$57.50	$58.00
New York, del.	....	60.78	61.28	....
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
Alabama City, Ala. R2	50.88	51.38	....	....
Birmingham, R2	50.88	51.38	....	....
Birmingham, S9	....	51.38	....	....
Woodward, Ala. W15	50.88	51.38	....	....
Cincinnati, del.	....	58.93	....	....
Buffalo District				
Buffalo, R2	54.50	55.00	55.50	....
Buffalo, H1	54.50	55.00	55.50	....
Tonawanda, N.Y. W12	54.50	55.00	55.50	....
So. Tonawanda, N.Y. T9	....	55.00	55.50	....
Boston, del.	65.15	65.65	66.15	....
Rochester, N.Y., del.	57.52	58.02	58.52	....
Syracuse, N.Y., del.	58.62	59.12	59.62	....
Chicago District				
Chicago, I-3	54.50	55.00	55.00	55.50
Gary, Ind. U5	54.50	....	55.00	....
Indiana Harbor, Ind. I-2	54.50	....	55.00	....
So. Chicago, Ill. W14	54.50	55.00	55.00	....
So. Chicago, Ill. Y1	54.50	55.00	55.00	....
So. Chicago, Ill. U5	54.50	....	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon, Mich., del.	....	61.30	61.30	....
Cleveland District				
Cleveland, A7	54.50	55.00	55.00	55.50
Cleveland, R2	54.50	55.00	55.00	....
Akron, O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O., N3	54.50	....	....	55.50
Duluth, I-3	....	....	55.00	....
Erie, Pa., I-3	54.50	55.00	55.00	55.50
Everett, Mass., E1	....	59.25	59.75	....
Fontana, Calif., K1	60.50	61.00	....	....
Granite City, Ill., G4	56.40	56.90	57.40	....
St. Louis, del. (Inc. tax)	57.15	57.65	58.15	....
Ironton, Utah, C11	54.50	55.00	....	....
Geneva, Utah, C11	54.50	55.00	....	....
Lone Star, Tex. L6	50.50	*51.00	51.00	....
Minnequa, Colo. C10	56.50	57.50	57.50	....
Rockwood, Tenn. T3	....	....	58.50	....
Pittsburgh District				
Neville Island, Pa. P6	....	55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge				
Aliquippa, del.	....	56.37	56.37	56.87
McKeesRocks, del.	....	56.04	56.04	56.54
Lawrenceville, Homestead,				
Wilmerding, Monaca, del.	....	56.66	56.66	57.16
Verona, Trafford, del.	....	57.19	57.19	57.69
Brackenridge, del.	....	57.45	57.45	57.95
Bessemer, Pa. U5	54.50	....	55.00	55.50
Clairton, Rankin, So. Duquesne, Pa. U5	54.50	....	....	....
McKeesport, Pa. N3	54.50	....	....	55.50
Monessen, Pa. P7	56.50	....	....	....
Sharpsville, Pa. S6	....	....	55.00	55.50
Steelton, Pa. B2	56.50	57.00	57.50	58.00
Swedeland, Pa. A3	58.50	59.00	59.50	60.00
Toledo, O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	....	....
Troy, N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard, O. Y1	54.50	55.00	55.00	....
Youngstown, Y1	54.50	55.00	55.00	....
Youngstown, U5	54.50	....	....	55.50
Mansfield, O., del.	59.15	59.65	59.65	60.15

*Low phos. southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.04% max P)

Niagara Falls, N.Y. P12	$91.00
Keokuk, Iowa, Openhearth & Fdry. frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.50
Steelton, Pa. B2	62.50
Philadelphia, delivered	66.05
Troy, N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Dec. 24, 1952, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company. Key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $81.00
Munhall,Pa. U5 ... 54.00
Seattle S24 ... 75.00

INGOTS, Alloy (NT)
Detroit R7 ... $57.00
Fontana,Calif. K1 ... 83.00
Houston S5 ... 65.00
Midland,Pa. C18 ... 57.00
Munhall,Pa. U5 ... 57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ... $59.00
Clairton,Pa. U5 ... 59.00
Ensley,Ala. T2 ... 59.00
Fairfield,Ala. T2 ... 56.00
Fontana,Calif. K1 ... 78.00
Gary,Ind. U5 ... 59.00
Johnstown,Pa. B2 ... 59.00
Lackawanna,N.Y. B2 ... 59.00
Munhall,Pa. U5 ... 59.00
So.Chicago,Ill. U5 ... 59.00
So.Duquesne,Pa. U5 ... 59.00
Carbon, Forging (NT)
Bessemer,Pa. U5 ... $70.50
Buffalo R2 ... 70.50
Canton,O. R2 ... 70.50
Clairton,Pa. U5 ... 70.50
Cleveland R2 ... 70.50
Conshohocken,Pa. A3 ... 77.50
Detroit R7 ... 73.50
Ensley,Ala. T2 ... 70.50
Fairfield,Ala. T2 ... 70.50
Fontana,Calif. K1 ... 89.50
Gary,Ind. U5 ... 70.50
Geneva,Utah C11 ... 70.50
Houston S5 ... 78.50
Johnstown,Pa. B2 ... 70.50
Lackawanna,N.Y. B2 ... 70.50
LosAngeles B3 ... 89.50
Munhall,Pa. U5 ... 70.50
Seattle B3 ... 89.50
So.Chicago R2,U5,W14 ... 70.50
So.Duquesne,Pa. U5 ... 70.50
So.SanFrancisco B3 ... 89.50
Alloy, Forging (NT)
Bethlehem,Pa. B2 ... $76.00
Buffalo R2 ... 76.00
Canton,O. R2 ... 76.00
Canton,O. T7 ... 78.60
Conshohocken,Pa. A3 ... 83.00
Detroit R7 ... 79.00
Fontana,Calif. K1 ... 95.00
Gary,Ind. U5 ... 76.00
Houston S5 ... 84.00
Ind.Harbor,Ind. Y1 ... 76.00
Johnstown,Pa. B2 ... 76.00
Lackawanna,N.Y. B2 ... 76.00
LosAngeles B3 ... 96.00
Massillon,O. R2 ... 76.00
Midland,Pa. C18 ... 76.00
Munhall,Pa. U5 ... 76.00
So.Chicago R2,U5,W14 ... 76.00
So.Duquesne,Pa. U5 ... 76.00
Struthers,O. Y1 ... 76.00
Warren,O. C17 ... 76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ... $87.50
Canton,O. R2 ... 87.50
Cleveland R2 ... 87.50
Fontana,Calif. K1 ... 108.50
Gary,Ind. U5 ... 87.50
Massillon,O. R2 ... 87.50
So.Chicago,Ill. R2 ... 87.50
So.Duquesne,Pa. U5 ... 87.50

SHEET BARS (NT)
Fontana,Calif. K1(43) ... $89.00

SKELP
Aliquippa,Pa. J5 ... $3.65
Munhall,Pa. U5 ... 3.55
Warren,O. R2 ... 3.55
Youngstown R2, U5 ... 3.55

WIRE RODS
Alton,Ill. L1 ... 4.70
AlabamaCity,Ala. R2 ... 4.325
Buffalo W12 ... 4.325
Cleveland A7 ... 4.325
Donora,Pa. A7 ... 4.325
Fairfield,Ala. T2 ... 4.325
Fontana,Calif. K1 ... 5.125
Houston S5 ... 4.725
Johnstown,Pa. B2 ... 4.325
Joliet,Ill. A7 ... 4.325
KansasCity,Mo. S6 ... 4.665
LosAngeles B3 ... 5.125
Minnequa,Colo. C10 ... 4.575
Monessen,Pa. P7 ... 4.525
No.Tonawanda,N.Y. B11 ... 4.325
Pittsburg,Calif. C11 ... 4.975
Portsmouth,O. P12 ... 4.525
Roebling,N.J. R5 ... 4.425
So.Chicago,Ill. R2 ... 4.325
SparrowsPoint,Md. B2 ... 4.425
Sterling,Ill.(1) N15 ... 4.325
Struthers,O. Y1 ... 4.325
Torrance,Calif. C11 ... 5.125
Worcester,Mass. A7 ... 4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.675
Lackawanna,N.Y. B2 ... 4.675
Munhall,Pa. U5 ... 4.675
So.Chicago,Ill. U5 ... 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.85
Aliquippa,Pa. J5 ... 3.85
Bessemer,Ala. T2 ... 3.85
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fairfield,Ala. T2 ... 3.85
Fontana,Calif. K1 ... 4.45
Gary,Ind. U5 ... 3.85
Geneva,Utah C11 ... 3.85
Houston S5 ... 4.25
Ind.Harbor,Ind. I-2 ... 3.85
Johnstown,Pa. B2 ... 3.90
KansasCity,Mo. S5 ... 4.45
Lackawanna,N.Y. B2 ... 3.90
LosAngeles B3 ... 4.45
Minnequa,Colo. C10 ... 4.30
Munhall,Pa. U5 ... 3.85
Niles,Calif.(22) P1 ... 4.56
Phoenixville,Pa. P4 ... 6.10
Seattle B3 ... 4.50
So.Chicago,Ill. U5, W14 ... 3.85
So.SanFrancisco B3 ... 4.40
Torrance,Calif. C11 ... 4.45
Weirton,W.Va. W6 ... 4.10
Wide Flange
Bethlehem,Pa. B2 ... 3.90
Clairton,Pa. U5 ... 3.85
Fontana,Calif. K1 ... 4.85
Johnstown,Pa. B2 ... 3.90
Lackawanna,N.Y. B2 ... 3.90
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85
Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.725
Fontana,Calif. K1 ... 5.925
Gary,Ind. U5 ... 4.725
Munhall,Pa. U5 ... 4.725
So.Chicago,Ill. U5 ... 4.725
H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 5.80
Bessemer,Ala. T2 ... 5.80
Bethlehem,Pa. B2 ... 5.80
Clairton,Pa. U5 ... 5.80
Fairfield,Ala. T2 ... 5.80
Fontana,Calif. K1 ... 6.40
Gary,Ind. U5 ... 5.80
Geneva,Utah C11 ... 5.80
Ind.Harbor,Ind. I-2 ... 5.80
Ind.Harbor,Ind. Y1 ... 6.30
Johnstown,Pa. B2 ... 5.80
Lackawanna,N.Y. B2 ... 5.80
LosAngeles B3 ... 6.35
Munhall,Pa. U5 ... 5.80
Seattle B3 ... 6.40
So.Chicago,Ill. U5 ... 5.80
So.SanFrancisco B3 ... 6.30
Struthers,O. Y1 ... 6.30
H.S., L.A. Wide Flange
Aliquippa,Pa. J5 ... 5.50
Bethlehem,Pa. B2 ... 5.80
Lackawanna,N.Y. B2 ... 5.80
Munhall,Pa. U5 ... 5.75
So.Chicago,Ill. U5 ... 5.75
BEARING PILES
Munhall,Pa. U5 ... 3.85
So.Chicago,Ill. U5 ... 3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.95
Bessemer,Ala. T2 ... 5.95
Clairton,Pa. U5 ... 5.95
Cleveland,Pa. R2 ... 5.95
Conshohocken,Pa. A3 ... 6.20
Ecorse,Mich. G5 ... 6.90
Fairfield,Ala. T2 ... 5.95
Fontana,Calif.(30) K1 ... 6.55
Gary,Ind. U5 ... 5.95
Geneva,Utah C11 ... 5.95
Ind.Harbor,Ind. I-2 ... 5.95
Ind.Harbor,Ind. Y1 ... 6.45
Johnstown,Pa. B2 ... 5.95
Munhall,Pa. U5 ... 5.95
Pittsburgh J5 ... 5.95
Seattle B3 ... 6.85
Sharon,Pa. S3 ... 5.95
So.Chicago,Ill. U5 ... 5.95
SparrowsPoint,Md. B2 ... 5.95
Warren,O. R2 ... 5.95
Youngstown Y1 ... 6.45
Youngstown U5 ... 5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ... 5.35
Coatesville,Pa. L7 ... 5.50
Conshohocken,Pa. A3 ... 5.55
Fontana,Calif. K1 ... 6.20
Gary,Ind. U5 ... 5.25
Johnstown,Pa. B2 ... 5.25
Munhall,Pa. U5 ... 5.25
Sharon,Pa. S3 ... 5.25
So.Chicago,Ill. U5 ... 5.25
SparrowsPoint,Md. B2 ... 5.25

FLOOR PLATES
Cleveland J5 ... 4.95
Conshohocken,Pa. A3 ... 4.95
Ind.Harbor,Ind. I-2 ... 4.95
Munhall,Pa. U5 ... 4.95
So.Chicago,Ill. U5 ... 4.95

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ... 4.15
Cleveland,c.l. R2 ... 4.50
Warren,O. ,c.l. R2 ... 4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.90
Aliquippa,Pa. J5 ... 3.90
Ashland,Ky. (15); A10 ... 3.90
Bessemer,Ala. T2 ... 3.90
Clairton,Pa. U5 ... 3.90
Claymont,Del. C22 ... 4.35
Cleveland,O. R2 ... 3.90
Coatesville,Pa. L7 ... 4.35
Conshohocken,Pa. A3 ... 4.35
Ecorse,Mich. G5 ... 4.45
Fairfield,Ala. T2 ... 3.90
Fontana,Calif.(30) K1 ... 4.50
Gary,Ind. U5 ... 3.90
GraniteCity,Ill. G4 ... 4.60
Geneva,Utah C11 ... 3.90
Harrisburg,Pa. C5 ... 6.50
Houston S5 ... 4.30
Ind.Harbor,Ind. I-2, Y1 ... 3.90
Johnstown,Pa. B2 ... 3.90
Lackawanna,N.Y. B2 ... 3.90
Minnequa,Colo. C10 ... 4.70
Munhall,Pa. U5 ... 3.90
Pittsburgh J5 ... 3.90
Seattle B3 ... 4.80
Sharon,Pa. S3 ... 4.15
So.Chicago,Ill. U5, W14 ... 3.90
SparrowsPoint,Md. B2 ... 3.90
Steubenville,O. W10 ... 3.90
Warren,O. R2 ... 3.90
Weirton,W.Va. W6 ... 4.20
Youngstown R2, U5, Y1 ... 3.90

PLATES, Carbon A.B.
Fontana,Calif. K1 ... 5.65
Geneva,Utah C11 ... 5.05

PLATES, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.95
Aliquippa,Pa. J5 ... 3.95
Alton,Ill. L1 ... 4.50
Atlanta,Ga. A11 ... 4.60
Bessemer,Ala. T2 ... 3.95
Buffalo R2 ... 3.95
Canton,O. R2 ... 3.95
Clairton,Pa. U5 ... 3.95
Cleveland R2 ... 3.95
Detroit R7 ... 4.10
Ecorse,Mich. G5 ... 4.30
Emeryville,Calif. J7 ... 4.70
Fairfield,Ala. T2 ... 3.95
Fontana,Calif. K1 ... 4.85
Gary,Ind. U5 ... 3.95
Houston S5 ... 4.35
Ind.Harbor,Ind. I-2 Y1 ... 3.95
Johnstown,Pa. B2 ... 3.96
KansasCity,Mo. S5 ... 4.55
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.40
Niles,Calif. P1 ... 4.65
N.Tonawanda,N.Y. B11 ... 3.95
Pittsburg,Calif. C11 ... 4.65
Pittsburgh J5 ... 3.95
Seattle B3, N14 ... 4.70
So.Chicago R2,U5,W14 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFran.,Cal. B3 ... 4.70
Sterling,Ill. N15 ... 4.55
Struthers,O. Y1 ... 4.55
Torrance,Calif. C11 ... 4.65
Weirton,W.Va. W6 ... 4.10
Youngstown R2, U5 ... 3.95

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ... 3.95
Atlanta, A11 ... 4.50
Niles,Calif. P1 ... 4.65
SanFrancisco S7 ... 5.00

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 ... 4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.675
Buffalo R2 ... 4.675
Canton,O. R2 ... 4.675
Canton,O. T7 ... 4.72
Clairton,Pa. U5 ... 4.675
Detroit R7 ... 4.825
Ecorse,Mich. G5 ... 5.025
Fontana,Calif. K1 ... 5.725
Gary,Ind. U5 ... 4.675
Houston S5 ... 5.075
Ind.Harbor,Ind. I-2, Y1 ... 4.675
Johnstown,Pa. B2 ... 4.675
KansasCity,Mo. S5 ... 5.275
Lackawanna,N.Y. B2 ... 4.675
LosAngeles B3 ... 5.725
Massillon,O. R2 ... 4.675
Midland,Pa. C18 ... 4.675
So.Chicago R2,U5,W14 ... 4.675
So.Duquesne,Pa. U5 ... 4.675
Struthers,O. Y1 ... 4.675
Warren,O. C17 ... 4.675
Youngstown U5 ... 4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.925
Gary,Ind. U5 ... 4.925
Youngstown U5 ... 4.925

BARS & SMALL SHAPES, H. S., High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.925
Bessemer,Ala. T2 ... 5.925
Bethlehem,Pa. B2 ... 5.925
Clairton,Pa. U5 ... 5.925
Cleveland R2 ... 5.925
Ecorse,Mich. G5 ... 6.675
Fairfield,Ala. T2 ... 5.925
Fontana,Calif. K1 ... 6.975
Gary,Ind. U5 ... 5.925
Ind.Harbor,Ind. I-2 ... 5.925
IndianaHarbor,Ind. Y1 ... 6.425
Johnstown,Pa. B2 ... 5.925
Lackawanna,N.Y. B2 ... 5.925
LosAngeles B3 ... 6.625
Pittsburgh J5 ... 5.925
Seattle B3 ... 6.675
So.Duquesne,Pa. U5 ... 5.925
So.SanFrancisco B3 ... 6.676
Struthers,O. Y1 ... 6.425
Youngstown U5 ... 5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W14 ... 4.925
BeaverFalls,Pa. R2 ... 4.925
BeaverFalls,Pa. M12 ... 4.925
Buffalo B5 ... 4.975
Camden,N.J. P13 ... 5.375
Carnegie,Pa. C12 ... 4.925
Chicago R5 ... 4.925
Chicago W18 ... 4.925
Cleveland A7, C20 ... 4.925
Detroit P17, R7 ... 5.075
Donora,Pa. A7 ... 4.925
Elyria,O. W8 ... 4.925
Franklin Park,Ill. N5 ... 4.925
Gary,Ind. R2 ... 4.925
Green Bay,Wis. F7 ... 4.925
Hammond,Ind. I-2, M13 ... 4.925
Hartford,Conn. R2 ... 5.475
LosAngeles R2 ... 6.375
Mansfield,Mass. B5 ... 5.475
Massillon,O. R2, R8 ... 4.925
Monaca,Pa. S17 ... 4.925
Newark,N.J. W18 ... 5.375
Plymouth,Mich. P5 ... 5.175
Pittsburgh J5 ... 4.925
Putnam,Conn. W18 ... 5.475
Readville,Mass. C14 ... 5.475
St.Louis,Mo. M5 ... 5.30
So.Chicago,Ill. W14 ... 4.925
SpringCity,Pa. K3 ... 5.375
Struthers,O. Y1 ... 4.925
Waukegan,Ill. A7 ... 4.925
Youngstown Y1 ... 4.925
Youngstown F3 ... 4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ... 6.00
BeaverFalls,Pa. M12 ... 6.00
Bethlehem,Pa. B2 ... 6.00
Buffalo B5 ... 6.00
Camden,N.J. P13 ... 6.40
Canton,O. R2 ... 6.00
Canton,O. T7 ... 5.99
Carnegie,Pa. C12 ... 6.00
Chicago B5 ... 6.00
Chicago W18 ... 6.00
Cleveland A7 ... 6.00
Cleveland C20 ... 6.00
Detroit P17, R7 ... 6.15
Donora,Pa. A7 ... 6.00
Elyria,O. W8 ... 6.00
Gary,Ind. R2 ... 6.00
Hammond,Ind. I-2 M13 ... 6.00
Hartford,Conn. R2 ... 6.45
Lackawanna,N.Y. B2 ... 6.00
Mansfield,Mass. B5 ... 6.45
Massillon,O. R2, R8 ... 6.00
Midland,Pa. C18 ... 6.00
Monaca,Pa. S17 ... 6.00
Newark,N.J. W18 ... 6.35
Plymouth,Mich. P5 ... 6.20
So.Chicago,Ill. R2, W14 ... 6.00
SpringCity,Pa. K3 ... 6.20
Struthers,O. Y1 ... 6.00
Warren,O. C17 ... 6.00
Waukegan,Ill. A7 ... 6.05
Worcester,Mass. A7 ... 6.35
Youngstown Y1 ... 6.00
Youngstown F3 ... 6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.95
Atlanta, A11 ... 4.50
Buffalo R2 ... 3.95
Cleveland R2 ... 3.95
Emeryville,Calif. J7 ... 4.70
Fairfield,Ala. T2 ... 3.95
Fontana,Calif. K1 ... 4.65
Gary,Ind. U5 ... 3.95
Houston S5 ... 4.35
Ind.Harbor,Ind. I-2, Y1 ... 3.95
Johnstown,Pa. B2 ... 3.95
KansasCity,Mo. S5 ... 4.55
Lackawanna,N.Y. B2 ... 3.95
LosAngeles B3 ... 4.65
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.75
Niles,Calif. P1 ... 4.65
Pittsburg,Calif. C11 ... 4.65
Pittsburgh J5 ... 3.95
SandSprings,Okla. S5 ... 4.85
Seattle B3, N14 ... 4.70
So.Chicago,Ill. R2 ... 3.95
So.Duquesne,Pa. U5 ... 3.95
So.SanFrancisco B3 ... 4.70
SparrowsPoint,Md. B2 ... 3.95
Sterling,Ill.(1) N15 ... 4.70
Struthers,O. Y1 ... 3.95
Torrance,Calif. C11 ... 4.65
Youngstown R2, U5 ... 3.95

BARS, Reinforcing (Fabricated; to consumers)
Huntington,W.Va. W7 ... 5.50
Johnstown, ¾-1" B2 ... 5.25
LosAngeles B3 ... 5.45
Marion,O. P11 ... 5.25
Seattle B3, N14 ... 5.50
So.SanFrancisco B3 ... 5.45
SparrowsPt. ¾-1" B2 ... 5.25
Williamsport,Pa. S19 ... 5.35

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ... 5.00
ChicagoHts.(3,4) I-2 ... 4.75
Franklin,Pa.(3,4) F5 ... 5.00
FortWorth,Tex.(26) T4 ... 5.10
Huntingt.W.Va.(3) W7 ... 5.75
Marion,O.(3) P11 ... 4.75
Moline,Ill.(3) R2 ... 4.05
Tonawanda(3,4) B12 ... 5.00
Williamsport(3) S19 ... 5.25
Williamsport(4) S19 ... 5.35

BARS, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa.(S.R.) B14 ... 9.60
Economy,Pa.(D.R.)B14 ... 11.90
Economy(Staybolt)B14 ... 12.20
McK Rks.(Staybolt)L5, 14.50
McK Rks.(S.R.) L5 ... 9.60
McK Rks.(D.R.) L5 ... 13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ... 3.775
Ashland,Ky.(8) A10 ... 3.775
Butler,Pa. A10 ... 3.775
Cleveland J5, R2 ... 3.775
Conshohocken,Pa. A3 ... 4.175
Detroit M1 ... 4.40
Ecorse,Mich. G5 ... 3.975
Fairfield,Ala. T2 ... 3.775
Fontana,Calif. K1 ... 4.725
Gary,Ind. U5 ... 3.775
Geneva,Utah C11 ... 3.875
GraniteCity,Ill. G4 ... 3.90
Ind.Harbor,Ind. I-2, Y1 ... 3.775
Irvin,Pa. U5 ... 3.775
Lackawanna,N.Y. B2 ... 3.775
Munhall,Pa. U5 ... 3.775
Niles,O. N12 ... 5.425
Pittsburg,Calif. C11 ... 4.575
Pittsburgh J5 ... 3.775
Sharon,Pa. S3 ... 4.175
So.Chicago,Ill. W14 ... 3.775
SparrowsPoint,Md. B2 ... 3.775
Steubenville,O. W10 ... 3.775
Torrance,Calif. C11 ... 4.575
Warren,O. R2 ... 3.775
Weirton,W.Va. W6 ... 3.775
WestLeechburg,Pa. A4 ... 3.925
Youngstown U5, Y1 ... 3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ... 4.925
Dover,O. R1 ... 5.825
Mansfield,O. E6 ... 5.65
Niles,O. N12 ... 5.675
Torrance,Calif. C11 ... 5.575

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy
Cleveland J5, R2 ... 5.675
Conshohocken,Pa. A3 ... 5.925
Ecorse,Mich. G5 ... 6.225
Fairfield,Ala. T2 ... 5.675
Fontana,Calif. K1 ... 6.625
Gary,Ind. U5 ... 5.675
Ind.Harbor,Ind. I-2 ... 5.675
Ind.Harbor,Ind. Y1 ... 6.175
Irvin,Pa. U5 ... 5.675
Lackawanna(35) B2 ... 5.675
Munhall U5 ... 5.675
Pittsburgh J5 ... 5.675
Sharon,Pa. S3 ... 5.675
So.Chicago,Ill. U5 ... 5.675
SparrowsPoint(36), B2 ... 5.675
Warren,O. R2 ... 5.675
Weirton,W.Va. W6 ... 6.025
Youngstown U5 ... 5.675
Youngstown Y1 ... 6.175

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 ... 6.925
Ecorse,Mich. G5 ... 7.475
Fontana,Calif. K1 ... 7.875
Gary,Ind. U5 ... 6.925
IndianaHarbor,Ind. Y1 ... 7.425
IndianaHarbor,Ind. I-2 ... 6.925
Irvin,Pa. U5 ... 6.925
Lackawanna(37) B2 ... 6.925
Pittsburgh J5 ... 6.925
SparrowsPoint(38) B2 ... 6.925
Warren,O. R2 ... 6.925
Weirton,W.Va. W6 ... 7.275
Youngstown Y1 ... 7.425

SHEETS, Cold Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.575
Cleveland,Ji. R2	4.575
Ecorse,Mich. G2	4.575
Fairfield,Ala. T2	4.575
Follansbee,W.Va. F4	5.575
Fontana,Calif. K1	5.525
Gary,Ind. U5	4.575
Granite City,Ill. G4	5.275
Ind.Harbor,Ind. I-2,Y1	4.575
Irvin,Pa. U5	4.575
Lackawanna,N.Y. B2	4.575
Middletown,O. A10	4.575
Pittsburg,Calif. C11	5.525
Pittsburgh J5	4.575
SparrowsPoint,Md. B2	4.575
Steubenville,O. W10	4.575
Warren,O. R2	4.575
Weirton,W.Va. W6	5.775
WestLeechburg,Pa. A4	5.45
Youngstown Y1	4.575

SHEETS, Galv'd No. 10 Steel

Alabama City,Ala. R2	5.075
Ashland,Ky.(8) A10	5.075
Canton,O. R2	5.075
Delphos,O. N16	5.675
Dover,O. R1	5.775
Fairfield,Ala. T2	5.075
Gary,Ind. U5	5.075
Granite City,Ill. G4	5.50
Ind.Harbor,Ind. I-2	5.075
Irvin,Pa. U5	5.075
Kokomo,Ind.(13) C16	5.475
MartinsFerry,O. W10	5.075
Niles,O. N12	6.275
Pittsburg,Calif. C11	5.825
SparrowsPoint,Md. B2	5.075
Steubenville,O. W10	5.075
Torrance,Calif. C11	6.425
Weirton,W.Va. W6	5.075

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. U5	7.625
SparrowsPoint(3) B2	7.775

SHEETS, Galvannealed Steel

Canton,O. R2	5.625
Irvin,Pa. U5	5.625
Kokomo,Ind.(13) C16	6.025
Niles,O. N12	6.825

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.325
Middletown,O. A10	5.325

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.925
Niles,O. R2 (28)	5.925
Weirton,W.Va. W6	5.775

SHEETS, Well Casing

Fontana,Calif. K1 (43)	5.10
Torrance,Calif. C11	5.275

BLUED Stock, 29 ga.

Yorkville,O. W10	7.00
Follansbee,W.Va. F4	7.10
Follansbee (23) F4	6.425

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.925
Cleveland R2	4.925
Gary,Ind. U5	4.925
Granite City,Ill. G4	5.625
Ind.Harbor,Ind. I-2	4.925
Irvin,Pa. U5	4.925
Middletown,O. A10	4.925
Youngstown Y1	4.925

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.50
Granite City,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
Granite City,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.35

SHEETS, Culvert No. 16 Pure Iron

	Cu	Cu Fe
Ashland,Ky. A10	5.875	....
Canton,O. R2	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5	5.875	6.125
Ind.Harbor,I-2	5.875	6.125
Irvin,Pa. U5	5.875	6.125
Kokomo,Ind. C16	6.525	....
MartinsFy.,O. W10	5.875	....
Pittsburg,Cal. C11	6.625	....
SparrowsPt. B2	5.875	....
Torrance,Cal. C11	6.625	....

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	6.125
Fairfield,Ala. T2	6.125
MartinsFerry,O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	4.025
Cleveland R2	4.375
Ind.Harbor,Ind. I-2	4.025
Warren,O. R2	4.375

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10	5.075
Cleveland R2	5.175
Middletown,O. A10	5.075
Warren,O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.325
Canton,O. R2	5.825

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	5.425

TINPLATE, American 1.25 Coke (Base Box)

	lb	lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt. Md. B2	8.80	9.05
Warren,O. R2	8.70	....
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

SHEETS, LT Coated Ternes, 6 lb (Commercial Quality)

Yorkville,O. W10	$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.05
Middletown,O. A10	5.475
Niles,O. N12	6.275
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.875

ROOFING SHORT TERNES (8 lb. Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.65
Conshohocken,Pa. A3	5.90
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.65
Fontana,Calif. K1	6.55
Gary,Ind. U5	5.65
Ind.Harb.,Ind. I-2	5.65
Ind.Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	5.70
Los Angeles(25) B3	6.75
Seattle(25) B3	6.65
Sharon,Pa. S3	5.65
So.SanFrancisco(25) B3	6.40
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown Y1	6.15
Youngstown U5	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	7.45
Cleveland A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	8.15
Lackawanna,N.Y. B2	7.90
Sharon,Pa. S3	7.30
SparrowsPoint,Md. B2	7.90
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown Y1	7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.725
Alton,Ill. L1	4.20
Ashland,Ky.(8) A10	3.725
Atlanta A11	4.275
Bessemer,Ala. T2	3.725
Bridgeport,Con.(10) S15	4.225
Buffalo(27) R2	3.725
Butler,Pa. A10	3.725
Carnegie,Pa. S18	4.225
Conshohocken,Pa. A3	4.125
Detroit M1	4.40
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	4.975
Gary,Ind. U5	3.725
Houston,Tex. S5	4.125
Ind.Harbor,Ind. I-2,Y1	3.725
Johnstown,Pa.(25) R2	3.725
KansasCity,Mo.(9) S5	4.325
Lackawna,N.Y.(32) B2	3.725
LosAngeles(25) B3	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.775
NewBritain(10) S15	4.225
N.Tonawanda,N.Y. B11	3.725
Pittsburg,Calif. C11	4.475
Riverdale,Ill. A7	3.725
SanFrancisco S7	5.00
Seattle(25) B3	4.725
Seattle N14	4.75
Sharon,Pa. S3	4.225
So.Chicago,Ill. W14	3.725
So.SanFrancisco(25) B3	4.475
SparrowsPoint,Md. B2	3.725
Sterling,Ill. N15	4.725
Torrance,Calif. C11	4.475
Warren,O. R2	3.725
Weirton,W.Va. W6	3.825
WestLeechburg,Pa. A4	3.975
Youngstown U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	6.05
Carnegie,Pa. S18	6.45
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	6.50
KansasCity,Mo. S5	6.70
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	6.05
Sharon,Pa. S3	6.45
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Bridgeprt,Conn.(10) S15	5.80
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D3	6.05
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	5.30
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	6.75
FranklinPark,Ill.(40) T6	5.35
Ind.Harbor,Ind. I-2	5.35
Lackawanna,N.Y. B2	5.10
LosAngeles C1	6.85
Mattapan,Mass. T6	5.95
Middletown,O. A10	5.10
NewBritain(10) S15	5.80
NewCastle,Pa. B4	5.80
NewCastle,Pa.(40) E5	5.70
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.60
Pawtucket,R.I. R3	6.45
Pawtucket,R.I.(21) N8	6.30
Riverdale,Ill.(40) A1	5.35
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.80
SparrowsPoint,Md. B2	5.10
Trenton,N.J. R5	6.45
Wallingford,Conn. W2	6.30
Warren,O.(40) T5	5.70
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown C8 (40)	5.70
Youngstown Y1	5.10

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.70
Weirton,W.Va. W6	5.10
Youngstown C8	5.70

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10) S15	12.15
Carnegie,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn,Conn.(10) S15	12.15
Pawtucket,R.I.(11) N8	12.15
Pawtucket,R.I.(12) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Riverdale,Ill. A1	4.30
Sharon,Pa. S3	4.55
Youngstown U5	4.15

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	....	7.65	8.25	10.20	12.50
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1	....	....	8.55	10.50	....
Carnegie,Pa. S18	....	7.65	8.25	10.20	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50	....	....
Detroit D2	6.45	7.50	8.10	....	....
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18	....	....	8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	....
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.70	7.60	8.20	....	....
NewYork W3	....	7.95	8.55	10.50	12.80
Pawtucket,R.I. N8: Cleve.orPitts.Base	....	7.65	8.25	10.20	12.50
Worcester,Mass.,Base	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5	....	7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8	....	7.65	8.25	10.20	12.50

Spring Steel (Tempered)

Trenton,N.J. R5 (29)	....	....	10.30	12.50	15.35
Harrison,N.J. C18	....	....	10.30	12.50	15.35
NewYork W3	....	....	10.30*	12.50*	15.35*
Youngstown C8	....	....	10.30	12.50	15.35

* Plus $1.575 per 100 lb.

TIN PLATE—Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
Granite City,Ill. G4	7.60	7.85	8.25
Indiana Harbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	....	....
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R (22 Ga.) COILS (Cut lengths 1/2c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. (cut lengths)	....	....	7.85	9.10	9.90
Brackenridge,Pa. A4	....	....	8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)	....	....	8.55	9.80	....
IndianaHarbor,Ind. I-2	7.55	7.85	(34)	(41)	....
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	7.05	7.35	7.85	....	....
Vandergrift,Pa. U5	....	7.55	8.35	9.60	10.40
Warren,O. R2	7.55	7.55	8.35	9.60	10.40
Zanesville,O. A10	....	7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Length 1/2c lower)

Transformer Grade	72	65	58	52
BeechBottom,W.Va. (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95	....	....	....
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	....	....	....
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div., H. K. Porter Co.
B14 A. M. Byers Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
AlabamaCity R2	6.075	6.325
Aliquippa Jo	6.075	6.325‡
Atlanta A11	6.325	6.575
Bartonville(19) K4	6.075	6.40
Buffalo W12	5.225	.....
Cleveland A7	6.075	6.225
Crawfordsv. *Ms	6.175	6.50
Donora,Pa. A7	6.075	6.225
Duluth,Minn. A7	6.075	6.225
Fairfield T2	6.075	6.225
Houston,Tex. S8	6.475	6.625
Johnstown B2	6.075	6.45†
Joliet,Ill. A7	6.075	6.225
KansasCy.Mo. S5	6.675	6.825
Kokomo C16	6.175	6.425
LosAngeles B3	7.025	.....
Minnequa C10	6.325	6.70*
Monessen,P7	6.075	6.45
Palmer W12	5.525	.....
Pitts.,Calif. C11	7.025	7.175
Prtsmth.(18)P12	6.475	.....
Rankin A7	6.075	6.225
So.Chicago R2	6.075	6.325
So.S.Fran. C10	7.025	7.40*
SparrowsPt. B2	6.175	6.55†
Sterling,Ill.(1) N15	6.075	6.40
Struthers,O. Y1	6.075	6.475
Torrance,Cal. C11	7.025	.....
Worcester A7	6.375	6.525

* Based on 14c zinc; † 14.50c zinc; ‡ 17.5c zinc.

WIRE (16 gage) (Add 4.7% on base and extras)	An'ld. Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(19) K4	10.25	12.00*
Cleveland A7	10.25	11.55
Crawfrdsville MS	10.73	12.51
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.73	12.58‡
Kokomo C16	10.625†	12.325†
Minnequa C10	10.40	12.425*
Palmer,Mass. W12	10.25	12.15
Pitts.,Cal. C11	10.60	11.90
SparrowsPt. B2	10.84	12.68‡
Waukegan A7	10.25	11.55
Worcester A7		11.85

* Based on 14c zinc, ‡ 14.50c zinc. † Includes 4.7% increase.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.225
Aliquippa,Pa. J5 (42)	4.85
Atlanta A11	5.475
Alton,Ill. L1	5.45
Bartonville,Ill. K4	5.325
Buffalo W12	5.225
Chicago W13	5.475
Cleveland A7, C20	5.225
Crawfordsville,Ind. MS	5.325
Donora,Pa. A7	5.225
Duluth,Minn. A7	5.225
Fairfield,Ala. T2	5.225
Fostoria,O. (24) S1	5.725
Houston S5	5.625
Johnstown,Pa. B2	5.225
Joliet,Ill. A7	5.225
KansasCity,Mo. S5	5.825
Kokomo,Ind. C16	5.325
LosAngeles B3	6.175
Minnequa,Colo. C10	5.475
Monessen,Pa. P7	5.475
Newark 6-8 ga. I-1	5.88
No.Tonawanda B11	5.225
Palmer,Mass. W12	5.525
Pittsburg,Calif. C11	6.175
Portsmouth,O. P12	5.625
Rankin,Pa. A7	5.225
So.Chicago,Ill. R2	5.225
So.SanFrancisco C10	6.175
SparrowsPoint,Md. B2	5.325
Sterling,Ill. (1) N15	5.225
Struthers,O. Y1	5.225
Torrance,Calif. C11	6.175
Waukegan,Ill. A7	5.225
Worcester,Mass. A7	5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12 (43)	6.35
Cleveland A7 (43)	5.85
Crawfsville,Ind. MS(43)	6.85
Dover,O. G6	6.20
Fostoria,O. S1 (43)	6.00
Kokomo,Ind. C16 (43)	5.70
FranklinPark,Ill. T6(43)	6.20
Massillon,O. R5 (43)	5.85
Monessen,Pa. P16 (43)	6.35
Monessen,Pa. P7 (43)	6.10
Pawtkt.R.I.(12) NS (43)	6.85
Trenton,N.J. R5 (43)	6.15
Worcester,Mass. A7 (43)	6.15
Worcester,Mass. T6 (43)	6.50
Worcester,Mass.W12(43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.90
Monessen,Pa. P16 (43)	8.50
Muncie,Ind. I-7 (43)	8.70
Roebling,N.J. R5 (43)	8.80
SparrowsPt.,Md. B2(43)	8.60
Johnstown,Pa. B2 (43)	8.50

ROPE WIRE

Alton,Ill. L1	9.15
Bartonville,Ill. K4	8.95
Buffalo W12 (43)	8.55
Fostoria,O. S1 (43)	8.85
Johnstown,Pa. B2 (43)	8.55
Monessen,Pa. P16 (43)	8.55
Monessen,Pa. P7 (43)	8.80
Muncie,Ind. I-7 (43)	8.75
Palmer,Mass. W12 (43)	8.85
Portsmouth,O. P12 (43)	8.55
Roebling,N.J. R5 (43)	8.85
SparrowsPt. B2 (43)	8.65
Struthers,O. Y1 (43)	8.55
Worcester J4, T6 (43)	8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 (43)	6.25
Alton,Ill. L1	6.85
Bartonville,Ill. K4	6.64
Buffalo W12 (43)	6.25
Cleveland A7 (43)	6.25
Donora,Pa. A7 (43)	6.25
Duluth,Minn. A7 (43)	6.25
Fostoria,O. S1 (43)	6.25
Johnstown,Pa. B2 (43)	6.25
Millbury(12) N6 (43)	8.05
Minnequa,Colo. C10 (43)	6.50
Monessen,Pa. P7 (43)	6.25
Monessen,Pa. P16	6.75
Muncie,Ind. I-7 (43)	6.45
Palmer,Mass. W12 (43)	6.55
Pittsburg,Calif. C11(43)	7.20
Roebling,N.J. R5 (43)	6.55
Portsmouth,O. P12(43)	6.25
So.Chicago,Ill. R2 (43)	6.25
So.SanFran. C10 (43)	7.20
SparrowsPt.,Md. B2 (43)	6.35
Struthers,O. Y1 (43)	6.25
Trenton,N.J. A7 (43)	6.55
Waukegan,Ill. A7 (43)	6.25
Worcester A7, T6 (43)	6.55
Worcester,Mass. W12(43)	6.55
Worcester,Mass. J4 (43)	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.275
Alton,Ill. L1	6.50
Buffalo W12	6.275
Cleveland A7	6.275
Donora,Pa. A7	6.275
Duluth,Minn. A7	6.275
Johnstown,Pa. B2	6.275
LosAngeles B3	7.225
Minnequa,Colo. C10	6.525
Monessen,Pa. P7	6.275
Monessen,Pa. P16(42)	6.40
NewHaven,Conn. A7	6.375
Palmer,Mass. W12	6.375
Pittsburg,Calif. C11	7.225
Portsmouth,O. P12	6.275
Roebling,N.J. R5	6.375
So.Chicago,Ill. R2	6.275
So.SanFrancisco C10	7.225
SparrowsPoint,Md. B2	6.375
Torrance,Calif. C11	7.225
Trenton,N.J. A7	6.375
Waukegan,Ill. A7	6.275
Worcester,Mass. A7	6.375

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill. K4	9.42
Buffalo W12 (43)	8.90
Chicago W13	9.32
Cleveland A7 (43)	8.90
Crawfsville,Ind. MS(43)	8.90
Fostoria,O. S1 (43)	8.90
Johnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16 (43)	8.90
Monessen,Pa. P16 (43)	8.90
Muncie,Ind. I-7 (43)	9.10
Palmer,Mass. W12 (43)	9.20
Roebling,N.J. R5 (43)	9.20
Waukegan,Ill. A7 (43)	8.90
Worcstr.Mass. A7,T6(43)	9.20

WIRE, Tire Bead

Bartonville,Ill. K4	11.51
Monessen,Pa. P16 (43)	11.40
Roebling,N.J. R5 (43)	11.55

WOVEN FENCE,9-15½ Ga. Col.

AlabamaCity,Ala. R2	135
Ala.City,Ala. 17-19ga.R2	222
Aliquippa,Pa.9-14½ga.J5	139†
Atlanta A11	140
Bartonville,Ill.(19) K4	137
Crawfordsville,Ind. MS	139
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Houston,Tex. S5	141
Johnstown,Pa. B2	138
Johnstown,17ga.,6" B2	229
Joliet,Ill. A7	133
KansasCity,Mo. S5	145
Kokomo,Ind. C16	140
Minnequa,Colo. C10	146*
Monessen,Pa. P7	138
Pittsburg,Calif. C11	156
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
Sterling,Ill.(1) N15	137

*Based on 14c zinc; ‡17½c zinc.

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	143
Duluth,Minn. A7	133
Franklin,Pa. F5	145
Huntington,W.Va. W7	148
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	144
Aliquippa,Pa. J5	148‡
Atlanta A11	149
Bartonville,Ill.(19) K4	146
Crawfordsville,Ind. MS	148
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	150
Johnstown,Pa. B2	147
Joliet,Ill. A7	142
KansasCity,Mo. S5	154
Kokomo,Ind. C16	144
Minnequa,Colo. C10	153*
Monessen,Pa. P7	147
Pittsburg,Calif. C11	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10	167*
SparrowsPoint,Md. B2	149
Sterling,Ill.(1) N15	146

*Based on 14c zinc; ‡17½c zinc.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	132
Atlanta A11	135
Bartonville,Ill.(19) K4	132
Crawfordsville,Ind. MS	134
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	144
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	156
SparrowsPoint,Md. B2	134
Sterling,Ill.(1) N15	132

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa. (31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85

AXLES

Ind Harbor,Ind. S13	5.65
Johnstown,Pa. B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	127
Aliquippa,Pa. J5 (44)	118
Atlanta A11	130
Bartonville,Ill.(19) K4	127
Chicago,Ill. W13	127
Cleveland A9 (44)	126
Crawfordsville,Ind. MS	130
Donora,Pa. A7	127
Duluth,Minn. A7	127
Fairfield,Ala. T2	127
Galveston,Tex. D7	135
Houston,Tex. S5 (44)	126
Johnstown,Pa. B2	127
Joliet,Ill. A7	127
KansasCity,Mo. S5 (44)	130
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	127
So.Chicago,Ill. R2	127
SparrowsPt.,Md. B2	129
Sterling,Ill.(1) N15	127
Torrance,Calif. C11	147
Worcester,Mass. A7	133

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	130
Bartonville,Ill. (19) K4	126
Chicago W13	127
Crawfordsville,Ind. MS	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
Kokomo,Ind. C16	128
Minnequa,Colo. C10 (45)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	145
Portsmouth,O. P12	132
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
SparrowsPt.,Md. B2	128
Sterling,Ill. N15	126
Torrance,Calif. C11	146
Worcester,Mass. A7	132

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.80
Wheeling,W.Va. W10	7.80

TIE PLATES

Fairfield,Ala. T2	4.75
Gary,Ind. U5	4.75
Ind.Harbor,Ind. I-2	4.75
Lackawanna,N.Y. B2	4.75
Minnequa,Colo. C10	$95.50*
Pittsburg,Calif. C11	4.925
Seattle B3	4.925
Steelton,Pa. B2	4.775
Torrance,Calif. C11	4.925

* Per net ton.

JOINT BARS

Bessemer,Pa. U5	4.925
Fairfield,Ala. T2	4.925
Ind.Harbor,Ind. I-2	4.925
Joliet,Ill. U5	4.925
Lackawanna,N.Y. B2	4.925
Minnequa,Colo. C10	4.925
Steelton,Pa. B2	4.925

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.65
KansasCity,Mo. S5	6.90
Lebanon,Pa. B2	6.65
Minnequa,Colo. C10	6.65
Pittsburgh J5	6.65
Seattle B3	7.15
So.Chicago,Ill. R2	6.65
Struthers,O. Y1	6.65
Youngstown R2	6.65

RAILS	Std. No. 1	Std. No. 2	All No. 2	60 lb Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675	.....	4.25
Fairfield,Ala. T2	.....	.....	.....	4.25
Gary,Ind. U5	3.775	3.675	3.725	.....
Huntington,W.Va. W7	.....	.....	.....	5.25
IndianaHarbor,Ind. I-2	3.775	3.675	3.725	.....
Johnstown,Pa. B2	.....	.....		(16) 4.25
Lackawanna,N.Y. B2	3.775	3.675	.....	4.25
Minnequa,Colo. C10	$73.50*	$73.50*	.....	4.75
Steelton,Pa. B2	3.775	3.675	.....	.....
Williamsport,Pa. S19	.....	.....	.....	5.00

* Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	Mo	
18	4	1	....		1.505
18	4	2	....		1.65-1.66
20	25	4	25	1.6	12.25 3.535-3.675
19	.4	2	7		2.460
18	25	4	25	1	4.75 2.125
18	4	2	9		2.445-2.45
13	5	4	3	....	1.6025
9	3	25	0.5	....	1.01

W	Cr	V	Mo	
6	4	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	.4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, F18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Chicago or Birm. base.
(7) To jobbers, 2 cnts. lower.
(8) 16 gage and heavier.
(9) 6-in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven Conn., base
(22) Del. San Francisco Bay area.
(23) 20 Ga. 26" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 0.85c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $31.50 per ton.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.25c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.

Key to Producers

M1	McLouth Steel Corp.
M4	Mahoning Valley Steel
M5	Medart Co.
M6	Mercer Tube & Mfg. Co.
M8	Mid-States Steel & Wire
M12	Moltrup Steel Products
M13	Monarch Steel Co.
N2	National Supply Co.
N3	National Tube Div.
N5	Nelsen Steel & Wire Co.
N6	NewEng-HighCarb.Wire
N8	Newman-Crosby Steel
N12	Niles Rolling Mill Div.
N14	Nrthwst. Steel Roll Mills
N15	Northwestern S.&W. Co.
N16	New Delphos Mfg. Co.
O3	Oliver Iron & Steel Corp.
O4	Oregon Steel Mills
P1	Pacific States Steel Corp.
P2	Pacific Tube Co.
P4	Phoenix Iron & Steel Co.
P5	Pilgrim Drawn Steel
P6	Pittsburgh Coke & Chem.
P7	Pittsburgh Steel Co.
P9	Pittsburgh Tube Co.
P11	Pollak Steel Co.
P12	Portsmouth Division, Detroit Steel Corp.
P13	Precision Drawn Steel
P14	Pitts. Screw & Bolt Co.
P15	Pittsburgh Metallurgical
P16	Page Steel & Wire Div., Amer. Chain & Cable
P17	Plymouth Steel Co.
R1	Reeves Steel & Mfg. Co.
R2	Republic Steel Corp.
R3	Rhode Island Steel Corp.
R5	Roebling Sons, John A.
R6	Rome Strip Steel Co.
R7	Rotary Electric Steel Co.
R8	RelianceDiv.,EatonMfg.
S1	Seneca Wire & Mfg. Co.
S3	Sharon Steel Corp.
S5	Sheffield Steel Corp.
S6	Shenango Furnace Co.
S7	Simmons Co.
S8	Simonds Saw & Steel Co.
S9	Sloss-Sheffield S.&I. Div.
S13	Standard Forgings Corp.
S14	Standard Tube Co.
S15	Stanley Works
S16	Struthers Iron & Steel
S17	Superior Drawn Steel Co.
S18	Superior Steel Corp.
S19	Sweet's Steel Co.
S20	Southern States Steel
S24	Seidelhuber Steel
T2	Tenn. Coal & Iron Div.
T3	Tenn. Prod. & Chem.
T4	Texas Steel Co.
T5	Thomas Strip Division, Pittsburgh Steel Co.
T6	Thompson Wire Co.
T7	Timken Roller Bearing
T9	Tonawanda Iron Div., Am. Rad. & Stan. San.
U4	Universal Cyclops Steel
U5	United States Steel Co.
V2	Vanadium-Alloys Steel
V3	Vulcan Crucible Steel Co.
W1	Wallace Barnes Co.
W2	Wallingford Steel Co.
W3	Washburn Wire Co.
W4	Washington Steel Corp.
W6	Weirton Steel Co.
W7	W. Va. Steel & Mfg. Co.
W8	West.Auto.Mach.Screw
W9	Wheatland Tube Co.
W10	Wheeling Steel Corp.
W12	Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13	Wilson Steel & Wire Co.
W14	Wisconsin Steel Div. International Harvester
W15	Woodward Iron Co.
W18	Wyckoff Steel Co.
Y1	Youngstown Sheet & Tube

You can keep speeds and feeds on the high side... when machining *Carpenter* stainless!

If you believe all stainless steels are "alike", you may be missing this opportunity to run your stainless machining jobs faster, more profitably! Plant records prove there is a difference in the uniformity and machinability of different makes of Types 416 and 303 Stainless. These same records show that with Carpenter No. 5 (Type 416) or No. 8 (Type 303), jobs went through without a hitch . . . where with other makes reports showed trouble with rejects, tolerances or finishes. The job described below is a good example! Consistent stainless fabrication results like this are possible in your plant . . . because Carpenter makes stainless that takes a cut smoothly, at higher speeds . . . stainless that feeds through your machine with day-in, day-out uniformity. This steel comes to you from the same mill that invented the first Free-Machining Stainless. You'll never know what you're missing until you specify "Carpenter". Best proof in the world is a trial order. The Carpenter Steel Company, 139 W. Bern St., Reading, Pa.

After changing from an ordinary Type 303 to Carpenter Stainless No. 8 (Type 303) for this aircraft aileron control, the records show: 25% better machining, 10% less rejects, improved finishes that eliminated grinding.

Export Department: The Carpenter Steel Co., Port Washington, N. Y. — CARSTEELCO

Carpenter

Free-Machining Stainless

takes the first 'ems out of production

Call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor

BUTTWELD STANDARD PIPE, T & C Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft	8.5c		11.5c		17c		23c		27.5c		37c											
Pounds Per Ft	0.85		1.13		1.68		2.28		2.73		3.68								5.82		7.62	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	32.5	15.25	35.6	18.25	38	20.75	38.5	20.5	39	21	39.5	21.5	40	21.25	40	21.25						
Alton, Ill. L1	29.6	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5						
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75						
Etna, Pa. N2 (†)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	23	40	21.75	40	21.75						
Fontana, Calif. K1 (†)	21	1.75	24	5.75	26.5	9.25	27	9	27.5	10	28	10.5	28.5	10.25	28.5	10.25						
Ind. Harbor, Ind. Y1 (†)	31.6	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75						
Lorain, O. N3 (*)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	28.25	39.5	28.75	40	28.25	40	28.25						
Sharon, Pa. M6	32.5	14.25	35.5	18.25	38	21.25	38.5	20.50	39	21.00	39.5	21.50	40	20.75	40	20.75						
Sparrows Pt., Md. B2	30.5	11.25	33.6	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75						
Youngstown R2 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75						
Youngstown Y1 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75						
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25						

SEAMLESS STANDARD PIPE, T & C Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5(‡)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (*)	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
Youngstown Y1 (‡)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (‡)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

BUTTWELD STANDARD PIPE, T & C Carload discounts from list, %

Size—Inches	⅛		¼		⅜		3½		4	
List Per Ft	5.5c		6c		6c		92c		$1.09	
Pounds Per Ft	0.24		0.42		0.57		9.20		10.88	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25
Butler, Pa. F6 (†)	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....
Etna, Pa. N2 (†)	30.5	1.25	25	+1.75	20	+5.5	33	14.25	33	14.25
Sharon, Pa. M6 (‡)	29.5	+9.25	23	+4.25	18	+8.25	..	....	..	....
Sparrows Pt., Md. B2	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....
Youngstown R2 (‡)	..	....	..	....	..	....	33	15.25	33	15.25
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 12.50c; (§), 14.50c; (*), 5c, with discounts adjusted depending on price of zinc at time of shipment.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

Cladding	Plates		Sheets		
	Carbon Base		Carbon Base		Copper Base
Stainless	10%	20%	10%	20%	Both Sides
302	....	....	19.75	24.24-27.50	77.00
304	25.00	29.50	24.50	27.50-27.77	77.00
309	30.50	35.00	....	....	....
310	36.50	41.00	....	....	144.00
316	29.50	34.00	26.00	35.92-36.50	....
317	34.50	39.00	....	....	....
318	33.50	38.00	....	....	....
321	28.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	21.25	27.75	....	....	....
410	20.75	27.25	....	....	....
Nickel	33.55	45.15	....	....	....
Inconel	41.23	54.18	....	....	165.00
Monel	34.93	46.28	....	....	....
Copper*	....	....	....	44.00	....

	Strip			
	Carbon Base			
	Cold-Rolled		Hot-Rolled	
	10%	Both Sides	10%	Both Sides
Nickel	41.00	54.00	....	....
Copper*	23.70	26.65	20.20	26.40

* Deoxidized. Production points for carbon base products: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, Inconel, monel-clad plates, Coatesville L7, nickel, copper-clad strip, Carnegie, Pa. S18; Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ¾-in.	18.5
⅞-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire Bolts	21
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P. Square:	Reg. Hvy.	
½-in. & smaller	15	
⅝-in. & ¾-in.	12	6.5
⅞-in.-1⅛-in.	9	1
1⅛-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	16.5	6.5
⅞-in.-1⅛-in.	12	2
1⅛-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in.	23	17.5
⅞-in. & 1⅛-in.	19.5	12
1⅛-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg. Hvy.	
½-in. & smaller	35	28.5
⅝-in. & ¾-in.	29.5	22
⅞-in.-1⅛-in.	24	15
1⅛-in. & larger	13	8.5
	Light	
½-in. & smaller	35	
⅝-in. to ¾-in.	28.5	
⅞-in. to 1⅛-in.	26	

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	42
¾-in. through 1 in.	34
Longer than 6 in.:	
⅝-in. and smaller	26
¾-in. through 1 in.	4

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvill fur	$14.50-15.00
Connellsvill fdy.	16.50-17.50
New River foundry	20.50
Wise county, foundry	19.95
Wise county, furnace	19.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.05
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	27.20
Lonestar, Tex., ovens	18.00
Philadelphia, ovens	23.95
Portsmouth, O., ovens	24.00
Cincinnati, del.	28.62
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.35 freight zone from works.

NOTE: Current prices on boiler tubes, coal chemicals, fluospar, electrodes and rivets appeared on page 105, Dec. 22 issue.

STAINLESS STEEL

(Add 4.7% on base price and extras)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	29.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Balt., Types 301-347 and 430 sheets, except 303 and 309 E2.

Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302, 38.50c, 304; 58.50c, 316, 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire 1-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7

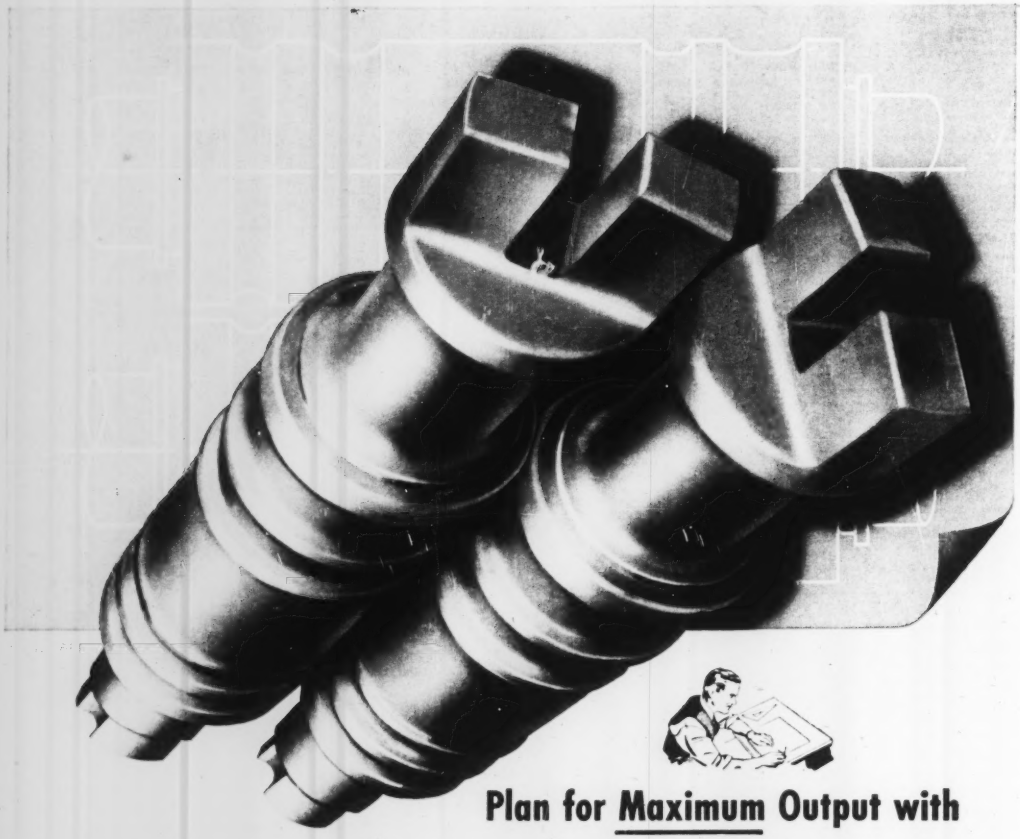
West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. New York, in bags	8.85-9.95
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe), minus 325 mesh	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	28.25-32.00
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	34.75
Lead	22.50
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	44.50
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	20.00-28.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum: 99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50



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WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140††§		Carbon	Floor
New York (city)	6.56	7.57	8.72	6.86	...	6.89	7.83‡	11.34	6.69	6.90	8.31
JerseyCity(c'try)	6.35	7.27	8.47	6.75	...	6.59	7.53	9.54	6.39	6.60	8.01
Boston (city)	6.71	7.56	8.74	6.75	...	6.62	7.69‡	11.38	6.76	6.95	8.18
Boston (c'try)	6.51	7.36	8.54	6.55	...	6.42	7.49‡	11.18	6.56	6.75	7.98
Phila. (city)	6.36	7.38	8.55	6.70	8.55	6.67	7.70‡	11.04	6.42	6.49	7.82
Phila. (c'try)	6.11	7.13	8.30	6.45	8.30	6.42	7.45‡	10.79	6.17	6.24	7.36
Balt. (city)	6.01	7.37	8.57	6.62	...	6.61	7.62‡	11.37	6.67	6.67	7.90
Balt. (c'try)	5.81	7.17	8.37	6.42	...	6.41	7.42‡	11.17	6.47	6.47	7.70
Norfolk, Va.	7.60	...	...	...	...	6.44	8.45	...	7.25	6.64	7.33
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.38	...	6.58	6.68	7.80
Wash. (w'hse)	6.31	7.61	8.90	6.89	...	6.90	7.78	...	6.93	6.95	8.17
Buffalo (del.)	6.00	6.85	8.61	6.41	...	6.10	7.15‡	11.27	6.28	6.50	7.87
Buffalo (w'hse)	5.80	6.65	8.41	6.21	...	5.90	6.95‡	11.07	6.08	6.30	7.67
Pitts. (w'hse)	5.80	6.65	8.00	5.94	...	5.83	6.90‡	10.65	5.95	5.95	7.18
Detroit (w'hse)	6.07	6.92	8.64	6.13	7.70-8.03	6.12	7.10‡	10.92	6.42	6.47	7.52
Cleveland (del.)	6.00	6.85	8.34	6.20	...	6.09	7.10‡	10.99	6.48	6.32	7.71
Cleve. (w'hse)	5.80	6.65	8.14	6.00	...	5.89	6.90‡	10.79	6.28	6.12	7.51
Cincin. (city)	6.28	6.87	8.62	6.29	...	6.28	7.31‡	11.22	6.57	6.62	7.75
Chicago (city)	6.00	6.85	8.20	6.03	...	6.03	7.00‡	10.85	6.15	6.15	7.38
Chicago (w'hse)	5.80	6.65	8.00	5.83	...	5.83	6.80‡	10.65	5.95	5.95	7.18
Milwau. (city)	6.17	7.02	8.37	6.20	...	6.20	7.27‡	11.02	6.32	6.32	7.55
Milwau. (c'try)	5.97	6.82	8.17	6.00	...	6.00	7.07‡	10.82	6.12	6.12	7.35
St. Louis (del.)	6.30	7.14	8.50	6.34	...	6.33	7.40‡	11.15	6.55	6.55	7.78
St. L. (w'hse)	6.10	6.94	8.00	6.14	...	6.13	7.20‡	10.95	6.35	6.35	7.58
Birm'hm (city)	5.95	6.80	7.85¤	5.95	...	5.95	8.40	...	6.10	6.25	8.65
Birm'hm(w'hse)	5.80	6.65	7.70¤	5.80	...	5.80	8.40	...	5.95	6.10	8.65
Los Ang. (city)	6.80	8.65	9.80	6.95	11.40	6.80	8.80‡	12.25	6.80	6.85	9.10
L. A. (w'hse)	6.60	8.45	9.60	6.75	11.20	6.60	8.60‡	12.05	6.60	6.65	8.90
Seattle-Tacoma	7.37	9.17	9.85	7.27	...	7.27	9.62‡	10.90§	6.95	7.20	9.11
S. Fran.(w'hse)	6.90	8.20	9.60	6.75	...	6.65	8.65‡	12.05	6.50	6.70	8.90

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ¤—500 to 1499 lb; ¤—450 to 1499 lb; ¤—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports

Old range bessemer	$9.45
Old range nonbessemer	9.30
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 67-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom.

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $85, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $225 per gross ton of alloy, c.l. packed $237; gross ton lots, packed, $252; less gross ton lots, packed $269; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Ashtabula, or Marietta, O. Base price: $227, Johnstown, Pa.; $225, Sheridan, Pa., Lynchburg, Va.; $228, Etna, Pa.; $226, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $267; less gross ton lots, $284, f.o.b. Chicago. Add or subtract $2.80 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.02% max, P 0.06% max). Add 0.5c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 40,000 lb or more, 30c; 2000 to 39,999 lb, 32c; 250 to 1999 lb, 34c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.5% C grade 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot Add 5c.

Ferrotitanium, High - Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x 4" x 45c per lb of alloy, ton lot 47c, less ton lot 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr, 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal. Fe) Lump, carload bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41. Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14, in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

Note: For current prices on chromium, silicon, vanadium, boron and tungsten alloys see page 107, Dec. 22 issue; calcium, zirconium, briquetted alloys and refractories, page 185, Dec. 15 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Dec. 24	$43.00
Dec. 18	43.00
Nov., 1952	43.00
Dec., 1951	43.00
Dec., 1947	40.13

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Grade	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Basing Point		
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnium, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades	
2 No. 1 Busheling	Base
3 No. 1 Heavy Melting	—$1.00
4 No. 2 Heavy Melting	— 1.00
5 No. 2 Bundles	— 1.00
6 Machine Shop Turnings	—10.00
7 Mixed Borings and Short Turnings	— 6.00
8 Shoveling Turnings	— 6.00
9 No. 2 Busheling	— 4.00
10 Cast Iron Borings	— 6.00
Elec. Furnace and Fdry. Grades	
11 Billet, Bloom & Forge Crops	+ 7.50
12 Bar Crops & Plate	+ 5.00
13 Cast Steel	+ 5.00
14 Punchings & Plate Scrap	+ 2.50
15 Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate	
16 3 feet and under	+ 3.00
17 2 feet and under	+ 5.00
18 1 foot and under	+ 6.00
19 Briquetted Cast Iron Borings	Base
Foundry Steel	
20 2 feet and under	Base
21 1 foot and under	+ 2.00
22 Springs and Crankshafts	+ 1.00
23 Alloy Free Turnings	— 3.00
24 Heavy Turnings	— 1.00
25 Briquetted Turnings	Base
26 No. 1 Chemical Borings	— 3.00
27 No. 2 Chemical Borings	— 4.00
28 Wrought Iron	+10.00
29 Shafting	+10.00
31 Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes

32 No. 1 Bundles	— 6.00
33 No. 2 Bundles	— 9.00
34 Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries, or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purposes.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 round heavy melting steel) for other grades of railroad steel scrap:

2 No. 2 Heavy Melting Steel	—$2.00
3 No. 2 Steel Wheel	Base
4 Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5 No. 1 Busheling	— 3.00
6 No. 1 Turnings	— 3.00
7 No. 2 Turnings, Drillings & Borings	—12.00
8 No. 2 Cast Steel and uncut wheelcenters	— 6.00
9 Uncut Frogs, Switches	Base
10 Flues, Tubes & Pipes	— 8.00
11 Structural Wrought Iron and/or Steel, uncut	— 6.00
12 Destroyed Steel Cars	— 8.00
13 No. 1 Sheet Scrap	— 9.50
14 Scrap Rails, Random Lengths	+ 2.00
15 Rerolling Rails	+ 7.00
Cut Rails	
16 3 feet and under	+ 5.00
17 2 feet and under	+ 6.00
18 18 inches and under	+ 8.00
19 Cast Steel, No. 1	+ 3.00
20 Uncut Tires	+ 2.00
21 Cut Tires	+ 5.00
Bolsters & Side Frames:	
22 Uncut	Base
23 Cut	+ 3.00
24 Angles, Splice Bars & Tie Plates	+ 5.00
25 Solid Steel Axles	+12.00
26 Steel Wheels, No. 3, oversize	Base
27 Steel Wheels, No. 3	+ 5.00
28 Spring Steel	+ 5.00
29 Couplers & Knuckles	+ 5.00
30 Wrought Iron	+ 8.00
31 Fireboxes	+ 8.00
32 Boilers	— 6.00
33 No. 2 Sheet Scrap	—13.00
34 Carsides, Doors, Car Ends, cut apart	— 6.00
35 Unassorted Iron & Steel	— 6.00
36 Unprepared scrap, not suitable for hydraulic compression	— 8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin, authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $5. For preparing into:

(4) Grade No. 25, $6.

(5) Grade No. 19, $6.

(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7) Grade No. 17 or No. 21, $11.

(8) Grade No. 18, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.
For preparing into:

(3) Grade No. 16, $4.

(4) Grade No. 17, $5.

(5) Grade No. 18, $7.

(6) Grade No. 21, $4.

(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into Grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1 No. 1 (Cupola)	$48.00
2 No. 2 (Charging Box)	47.00
3 No. 3 (Hvy. Breakable)	45.00
4 No. 4 (Burnt Cast)	41.00
5 Cast Iron Brake Shoes	41.00
6 Stove Plate	46.00
7 Clean Auto Cast	52.00
8 Unstripped Motor Blocks	43.00
9 Wheels, No. 1	47.00
10 Malleable	55.00
11 Drop broken machinery	52.00

OPEN MARKET

(Delivered prices include broker's commission.)

Birmingham
(Delivered)

Shoveling turnings	$30.00-32.00
Cast iron borings	30.00-32.00
No. 1 cupola cast	47.00-48.00
Stove plate	42.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston
(F.o.b. shipping point)

No. 1 cupola cast	41.00
Heavy breakable	36.00
Stove plate	34.00-35.00
Unstripped motor blocks	30.00

Buffalo
(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 1 busheling	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Short shoveling turnings	38.00
No. 1 cupola cast	45.50-46.50
No. 1 machinery cast	49.00-50.00

Chicago
(Delivered)

No. 2 heavy melting	42.50
No. 2 bundles	42.50
Machine shop turnings	30.50-32.50
Mixed borings, turnings	34.50-36.50
Shoveling turnings	34.50-36.50
Cast iron borings	34.50-36.50
No. 1 cupola cast	43.00-45.00
Charging box cast	41.00-43.00
Heavy breakable	38.00-40.00
Burnt cast	37.00-39.00
Cast iron brake shoes	39.00-41.00
Stove plate	41.00-43.00
Clean auto cast	44.00-46.00
Unstripped motor blocks	35.00-37.00
Malleable	46.00-48.00
Drop broken machinery	46.00-48.00

Cleveland
(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Shoveling turnings	38.00
Cast iron borings	38.00
(F.o.b. shipping point)	
No. 1 cupola cast	49.00
Charging box cast	47.00
Burnt cast	41.00
Stove plate	46.00
Clean auto cast	52.00
Unstripped motor blocks	43.00
Malleable	56.00
Drop broken machinery	52.00

Detroit
(F.o.b. shipping point)

No. 1 cupola cast	47.00-48.00
Heavy breakable	43.00-44.00
Clean auto cast	49.00-50.00
Unstripped motor blocks	40.00-41.00
Drop broken machinery	50.00-52.00
Charging box cast	44.00-45.00

Los Angeles
(Delivered)

No. 1 heavy melting	34.00
No. 2 heavy melting	29.00
No. 1 bundles	36.00
No. 2 bundles	29.00
No. 1 cupola cast	46.00
Machine shop turnings	14.00

New York
(Brokers' buying prices)

No. 2 heavy melting	35.99
Mixed borings, turnings	29.99
Machine shop turnings	25.99
Cupola cast	40.00-41.00
Unstripped motor blocks	31.00-32.00

Philadelphia
(Delivered)

No. 1 heavy melting	41.50†
No. 2 heavy melting	41.50†
No. 1 bundles	42.50†
No. 2 bundles	41.50†
No. 1 busheling	42.50†
Mixed borings, turnings	36.50†
Machine shop turnings	32.50†
Short shoveling turnings	36.50†
No. 1 cupola cast	45.00-46.00††
Unstripped motor blocks	38.00††
Heavy breakable	47.50††
Machinery cast	52.00††
Charging box cast	47.50††

† Ceiling price. ‡Nominal
§ Shipping point. ††Delivered.

Pittsburgh
(Delivered)

No. 2 heavy melting	44.00†
No. 1 bundles	45.00†
No. 2 bundles	44.00†
Machine shop turnings	35.00†
Shovel turnings	39.00†
No. 1 cupola cast	48.50
Heavy breakable	45.00

† Ceiling price.

San Francisco
(Delivered)

No. 2 heavy melting	29.00
Machine shop turnings	14.00
No. 2 bundles	29.00
No. 1 cupola cast	44.00

Seattle
(F.o.b. shipping point)

No. 1 bundles	30.00
No. 1 cupola cast	41.00
Heavy breakable	36.00-38.00
Unstripped motor blocks	31.00

St. Louis
(Delivered)

No. 1 cupola	48.00
Unstripped motor blocks	37.00

Youngstown
(Delivered)

No. 2 heavy melting	43.00
No. 2 bundles	43.00
Machine shop turnings	34.00

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.50
Rails, Remelting	35.50
Rails, Rerolling	44.50
Busheling	30.00
Busheling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings, Cast Iron Grades	32.50
No. 1 Machinery Cast	50.00

†F.o.b. shipping point.

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The Metal Market

Chilean Copper Pours from Converter

Smoke pours from a copper converter in action at Chile Exploration Co.'s new sulphide ore plant at Chuquicamata, Chile. Anaconda Copper Mining Co., the parent company, announces shipments of blister copper from this plant have already arrived in the U. S. Anaconda's subsidiary, International Smelting & Refining Co., Perth Amboy, N. J., will electrolytically refine the copper produced here

All's quiet in the holiday-conscious metals market, but buyers and sellers are planning for a new year that will be even busier than 1952

RELATIVE QUIET marks the holiday-conscious market as buyers and sellers assess a hectic 1952 and lay plans for a new year that promises to be even busier.

Aluminum users note the dickering between government and aluminum producers over contract changes as meaning an eventual price hike on mill products whether or not this contract goes through as proposed. Feeling is that the present negotiations for a sixth and possibly a seventh primary producer is bogged down by low earnings in prospect at present prices. The increase, if forthcoming under the deal now being studied, will add half a cent to raw aluminum prices and 4 per cent to mill product prices.

Under the proposed contract, the government would obligate itself to buy all new production for at least five years—double the presently specified period—if no market could be found for the metal. Companies in return would give up their present right to return new plants to the government.

Briefly Noted—Fabricators using CMP materials are studying first and second quarter allocations for clues to setting production schedules. Copper users, for example, speculate on the eventual size of supplementary rations. Breakdown of third and fourth quarter receipts by brass and wire mills show 43 per cent foreign metal.

Zinc buyers are conducting a minimum of business even though inventories are low. Prime western buying is still on an average price basis. Galvanizers, die casters and brass mills will hold off replenishing stocks until they have more assurance of the direction and velocity of the price winds. Lead users, now openly optimistic about business next year, nevertheless are holding out orders till the calendar turns.

Observation—NPA, noting the historical ebb and flow of scrap, says that the first quarter will see "large accumulations of copper scrap both at home and abroad begin to seek their markets." Aluminum scrap supply will exceed by "as much as 10 per cent the amount available for consumption in 1952" because of new production facilities adding to tonnage normally available.

Tin buying policy of RFC is finding many interpretations. Bolivian tin is a delicate diplomatic problem now and the state department, which must make the ultimate decisions on RFC purchases from the Bolivians, says it has not ruled out the possibilities of further short term purchases. Compensation of investors in the nationalized properties keeps the situation in a state of flux.

Nickel Will Remain Critical

Nickel will continue to be a critical metal during 1953. Free world production this year rose 6.8 per cent over 1951 but there's still not enough for defense, stockpile and unrestricted civilian use. Dr. John F. Thompson, chairman, International Nickel Co. of Canada, says free world output this year will approximate 157,500 tons, 10,000 tons more than 1951 production. Canada, incidentally, supplies about 90 per cent of the total free world supply. Dr. Thompson noted that nickel-bearing scrap is now flowing more freely.

Commenting on producers' activities, Dr. Thompson says that Inco's $150-million underground mine expansion program will assure the company of about 125,000 tons of refined nickel production annually. Falconbridge Nickel Mines Ltd. will have annual capacity of 17,500 tons in 1954; Sherritt Gordon Mines Ltd. will have an 8500-ton refinery in operation in 1953; S. A. Le Nickel, a French firm in New Caledonia, is reportedly producing at a rate of 7000 tons yearly and the U. S.-financed Nicaro, Cuba, nickel project is now producing towards its goal of 26,000 tons annually.

Aluminum Sets Record

The dynamic American aluminum industry shattered all production records in 1952 and promises to continue beating its own marks for years to come. Hamstrung by lack of steel for construction and hydroelectric power in the fourth quarter, U. S. producers nevertheless turned out an estimated 930,000 tons of primary aluminum during the year, says the aluminum association's Donald M. White. Output rise over 1951 is about 10 per cent; best previous tonnage year was 1943, when 920,179 tons of raw metal were poured. Next year should surely be the industry's first million-ton year.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115), 27.25c; 88-10-2 (No. 215), 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 12.50c; brass special 12.75c; intermediate 13.00c; East St. Louis, high grade 12.85c, delivered.

Lead: Common, 14.00c; chemical 14.15c; corroding, 14.15c; all Louis.

Primary Aluminum: 99% plus ingots 20.00c; pigs, 19.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades notch bars, granulated or shot, grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99.50-99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $215-$218, nominal, per 76-lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.595 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $1.75-$2 del; special or patented shapes $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 83.25c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $175-$185 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective July 1, 1952)

Sheet: Copper 45.52; yellow brass 40.17; commercial bronze, 95% 45.15; 90% 44.38; red brass, 85% 43.10; 80% 42.34; best quality, 41.35; nickel silver, 18% 55.08; phosphor-bronze grade A, 5% 64.71.

Rod: Copper, hot-rolled 41.37; cold-drawn 42.62; yellow brass free cutting 33.85; commercial bronze 95% 44.84, 90% 44.07; red brass 85% 42.79; 80% 42.03.

Seamless Tubing: Copper 45.56; yellow brass 43.18; commercial bronze, 90%, 47.04; red brass, 85% 46.01.

Wire: Yellow brass 40.46; commercial bronze, 95% 45.44; 90% 44.67; red brass, 85% 44.39; 80% 42.63; best quality brass, 41.64.

(Base prices, effective July 1, 1952)

Copper Wire: Bare, soft, f.o.b. eastern mills, 1,000 lb lots, 32.795; 30,000 lb lots, 32.92 l.c.l., 33.42. Weatherproof, 100,000 lb, 33.60; 30,000 lb, 33.85 l.c.l., 34.35. Magnet wire del., 15,000 lb or more, 38.75; l.c.l., 39.50.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c; 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Aug. 4, 1952.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	31.6	...	...
0.135-0.096	12-48	32.1	...	...
0.095-0.077	12-48	32.8	30.6	34.9
0.076-0.061	12-48	33.4	30.8	35.1
0.060-0.048	12-48	33.7	31.0	35.4
0.047-0.038	12-48	34.1	31.3	35.7
0.037-0.030	12-48	34.5	31.7	36.3
0.029-0.024	12-48	35.1	32.0	36.8
0.023-0.019	12-36	35.7	32.7	37.5
0.018-0.017	12-36	36.4	33.3	38.4
0.016-0.015	12-36	37.3	34.0	39.5
0.014	12-24	38.3	35.0	40.8
0.013-0.012	12-24	39.3	35.7	41.7
0.011	12-24	40.3	36.8	43.3
0.010-0.0095	12-24	41.4	37.9	44.8
0.009-0.0085	12-24	42.6	39.1	46.6
0.008-0.0075	12-24	44.0	40.3	48.4
0.007	12-18	45.5	41.7	50.6
0.006	12-18	47.0	43.1	55.4

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (In.) or distance across flats	—Round— R317-T4	—Hexagonal— R-317-T4	17S-T4
0.125	54.6	....	....
0.156-0.0188	46.2	....	....
0.219-0.313	43.6	....	....
0.375	42.0	48.3	50.4
0.406	42.0	....	....
0.438	42.0	48.3	50.4
0.469	42.0	....	....
0.500	42.0	48.3	50.4
0.531	42.0	....	....
0.563	42.0	....	47.3
0.594	42.0	....	....
0.625	42.0	45.7	47.3
0.688	42.0	....	47.3
0.750-1.000	41.0	43.1	44.6
1.063	41.0	....	43.1
1.125-1.500	39.4	41.5	43.1
1.563	38.9	....	....
1.625	38.3	....	41.5
1.688-2.000	38.3	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh). Sheets: Full rolls, 140 sq ft or more $19.25 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $19.25 per cwt; Traps and bends: List prices plus 43%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $13; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap; 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dual type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

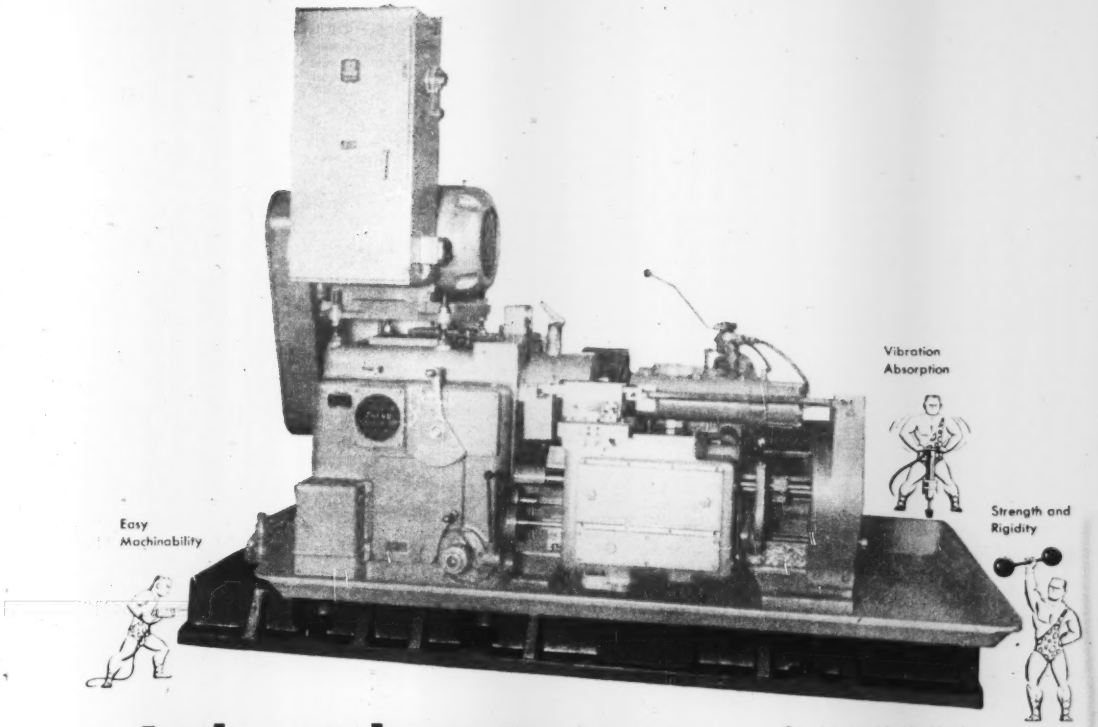
Lead: Heavy 10.75-11.25; battery plates 5.90-6.15; linotype and stereotype 12.50-13.00; electrotype 10.75-11.00; mixed babbitt 13.75-14.00.

Zinc: Old zinc, 5.50-6.00; new die cast scrap, 5.50-6.00; old die cast scrap, 4.00-4.50.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Dec. 22-24	24.50	14.05	12.50	121.50	20.00	34.50	56.50	83.25
Dec. 1-20	24.50	13.80	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 24-29	24.50	13.80	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 20-22	24.50	14.06	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 12-19	24.50	14.30	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 11	24.50	14.00	12.50	121.50	20.00	34.50	56.50	83.25
Nov. 3-10	24.50	13.80	12.50	121.50	20.00	34.50	56.50	83.25
Nov. Avg	24.50	13.965	12.50	121.50	20.00	34.488	56.50	83.25
Oct. Avg	24.50	14.226	13.259	121.50	20.00	39.00	56.50	83.25
Sept. Avg	24.50	15.80	13.98	121.50	20.00	39.00	56.50	82.25
Aug. Avg	24.50	15.80	14.057	121.50	19.923	39.00	56.50	83.25
July Avg	24.50	15.80	15.00	121.50	19.00	39.00	56.50	82.885
June Avg	24.50	15.05	15.74	121.50	18.00	39.00	56.50	82.75
Dec. 1951 Avg	24.50	18.50	19.50	103.00	19.00	50.00	56.50	88.00
Dec. 1947 Avg	21.50	14.825	10.50	85.704	15.00	33.00	35.00	74.625

NOTE: Copper: Electrolytic del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99% del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.



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- Rigidity
- Wear Resistance
- Corrosion Resistance
- Vibration Absorption
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The manufacturer of this automatic lathe had previously used a fabricated steel base. To cut down delivery time and reduce costs, a switch was made to a cast Gray Iron base.

In the manufacturer's own words . . . "in addition to appreciable cost savings, delivery time to our machine shop is about one-eighth that of fabricated steel. Because of the rigidity inherent in the casting, we have a base which is easy to machine, absorbs vibration, and does the kind of a job our customers expect."

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GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO

Sheets, Strip . . .

Sheet and Strip Prices, Page 107 & 108

Cleveland—Except for the holiday lull producers of the light, flat-rolled products see no change in demand pressure for months to come. Some sellers have not yet opened their books for second quarter on hot and cold-rolled sheets, deferring action as long as possible to permit as thorough sizeup of the supply picture as possible. Second quarter books on sheet specialties have been opened, however.

Carryover tonnage from fourth to first quarter in hot and cold-rolled sheets will be so heavy little new business can be accepted for the first three months of the new year. This means the overflow from first to second quarter will be large.

Demand pressure appears to be increasing from all directions, notably from the automotive industry and appliance manufacturers and while more steel will be available for civilian use over coming months tight supply conditions will be only slightly relieved. In fact, should the Korean war be stepped up, seen as a distinct possibility after the new Republican administration takes office Jan. 20, even tighter supply conditions may prevail despite larger production.

Boston—Demand for carbon sheets has not eased as some expected. Substantial improvement in supply is not likely before second quarter. Consumers are promptly placing April-June orders where tickets are available. Many have only March placed with mills for first quarter and will have to depend heavily on warehouses during January-February. Galvanized sheets are more readily available.

New York—Manufacturers of consumer durables here are finding it difficult to place tonnage against the extra "bonus" of 550,000 tons of finished steel, mostly sheets and strip, for first quarter, announced by Washington. Most district sellers insist they haven't space for another available pound of commercial work for delivery in that period, and say that even as matters stand they haven't been able for some time to cash a number of first quarter tickets presented by buyers here, to say nothing of cashing additional "bonus" tickets. However, somewhere in the country such additional tickets may find a spot, for the extra allotment is said to be based on a telegraphic survey by Washington which indicated that such surplus was available.

Pittsburgh—Some ticket holders wanting sheets during second quarter may not be able to place their orders. Conversion inquiries for tonnage deliveries are reported but expanded production probably will keep such orders down. Recently announced supplemental tonnage for automotive purposes will further tighten availability of sheet and strip for first quarter.

Chicago—Fact that civilian users are being given a second steel bonus in first quarter doesn't mean the mills will have more tonnage to give them. Take sheets for example. Books are completely filled and carryover from fourth quarter will be four to six weeks. There's been a feeling that some consumers are on books for more tonnage than they have tickets to cover.

St. Louis—Cold-rolled sheet demand continues strong in this area and there will be a year-end carryover of at least two and a half months' mill capacity. Granite City Steel Co. expects to open second quarter books shortly. Currently it is figuring its deficiencies will be at the end of March after compensating in the first quarter for production lost during the summer steel strike. Galvanized demand is spotty. Consumer pressure in Iowa and Minnesota has been eased by bad weather and dealers have been able to refill inventories. Mills report no order cancellations.

Steel Bars . . .

Bar Prices, Page 107

Chicago—Barmakers feel that their product very well can set the pace for steel consumption in first half of next year. Small sizes probably won't cause too much trouble, but the heavier sizes won't come anywhere near meeting the terrific demand. So much of the tonnage is in the hot-topped and quality grades that yield suffers because of the longer processing.

Cleveland—No supply relief in large-size bars is in sight. In fact, even tighter supply conditions are anticipated in some quarters over coming months should the Korean war be stepped up. Meanwhile, small-sizes are readily available and some January tonnage is reported being shipped from the mills. Expectations are there will be little open space in rolling schedules in first and second quarters with military and defense projects continuing to have first call on output. Production schedules were curtailed over the Christmas holiday and production over New Year's will be similarly affected at many mills.

Boston—Any improvement in carbon bar volume next quarter will be in smaller sizes, including high-carbon flats. Cold-finished rounds, 3-in. and under are somewhat freer than hot-rolled within that size range. In scattered instances converters are getting some ex-allotment tonnage while shipments to warehouse are slightly increased in smaller sizes. Second quarter openings for commercial tonnage in both alloys and carbon are filling. Numerous first quarter tickets for both grades found no openings.

New York—Hot carbon bar producers offer little hope to consumers that they will be able to provide more tonnage in first quarter. Some say they are already oversold and haven't been able to promise tonnage against many tickets offered them for that period. The situation in large rounds remains tight, and as producers now open books for second quarter they anticipate sufficient tonnage to keep them busy throughout. Some are opening books on a monthly basis only in an effort to keep orders and commitments in as close balance as possible. Opinion is, however, that producers will be able to turn out more tonnage in second quarter than in the first.

Philadelphia—Virtually all hot carbon bar producers have opened books for second quarter, or at least for the first month of the period. While more tonnage will be available, little, if any, surplus is expected to develop as demand should remain strong beyond midyear.

Pittsburgh—Steel bar producers are looking forward to good business through second quarter. Books have been opened for the period, but mills say it is too early to make concrete statements about tonnage availability.

Wire . . .

Wire Prices, Page 109

New York—Carryover in fine carbon specialties into first quarter will not be heavy. There are still openings for March and even earlier on some products in this category. Most producers will not be able to meet obligations on upholstery spring wire. Capacity on larger gages of manufacturers wire is well taken up through March. Specialties required for automobile assembly, including valve spring wire, are under delivery pressure and some orders are being placed for second quarter. Clock spring demand is slow, also most textile equipment wire.

Los Angeles—Supplies of nails and wire mesh are abundant and trade observers expect a surplus as building loses momenum.

Plates . . .

Plate Prices, Page 107

Boston—Allotments for second quarter with weldment and other plate fabricating shops are close to first quarter tonnage, but consumers experience difficulty in placing all authorized tonnage with mills. Uncertainty as to demand against set-asides and Z-2 orders tends toward caution on forward commitments. Buyers with Z-2 ratings are not too anxious for decontrol fearing loss of tonnage without that priority. Military stretchouts are deferring some weldment shipments. Strip mill plate supply had improved.

New York—Most plate mills have opened books for second quarter, or for at least the first month of the period. They anticipate a continued highly active demand the entire first half, especially if carbuilding schedules are stepped up in second quarter to an average monthly output of 9000 cars. Steel allocations for car builders and certain other major plate consuming groups have been increased by the government for second quarter, although some leading producers doubt greatly if the additional requirements can be filled, as sheared plate capacity is undergoing little expansion. Only relief for bulging demands appears to be in strip plate. Meanwhile it appears that many first quarter tickets will not find a spot and will have to be forgotten once the period expires.

Philadelphia—District plate mills are opening their books for shipment after Mar. 31, but in some cases only for the first month rather than for full second quarter. Demand is pressing and most producers antic-

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ipate high operations throughout second quarter.

Pittsburgh—Plates will be in tight supply during second quarter. If current military orders are any indication even lighter gage plates will be tight. Car and tank builders may find shorter second quarter supplies than they had anticipated.

Structural Shapes . . .

Structural Shape Prices, Page 107

New York—Shape mills see heavy work ahead. Much public construction is in prospect, such as bridges and highway work, and considerable military and other high rated defense projects, including further atomic energy needs. Many of these requirements will come up for rolling in second quarter, at which time considerably more railroad equipment tonnage will be pressing, especially if present plans are fulfilled in meeting a building schedule of 9000 cars per month during second quarter. Meanwhile, shape mills are likely to maintain tight schedules, as backlogs are heavy. Fabricating shops likewise have good order books and are concerned primarily with the matter of obtaining sufficient supply of steel in the required shapes and sizes to maintain top operations. Most have not yet been able to do this.

Philadelphia—Structural activity is featured by award of 1000 tons for a section of the Market St. subway here. Several bridge jobs are up for early action.

Pittsburgh—Second quarter books are open but it is too early for the mills to predict the status of ticket orders. Much will depend on developments in Korea. Meanwhile, structural fabricators press for more steel, particularly wide flange beams. Carbuilders are not operating at capacity.

Pig Iron . . .

Pig Iron Prices, Page 106

Cleveland—Some quickening in foundry activity is expected after the turn of the year reflecting the noticeable pickup in manufacture of appliances in evidence recently. Consequently, pressure for merchant pig iron is likely to increase, and should the government regulation limiting consumer inventories to 30-days supply be lifted, iron demand would likely jump sharply since most foundries, it is thought, would make an effort to improve their stock position. This would be especially true in event the Korean war is stepped up. Current holiday lull is only slightly felt in the pig iron trade. All but one of the 10 blast furnaces in this immediate district are operating and the idle stack is expected to be returned to production around the first of January. It has been down for relining. While steelworks operations were curtailed over Christmas blast furnace and coke plant production was maintained without interruption.

New York—Movement of iron is at low ebb because of the holidays. Most shops are observing long holiday week-ends both this week and last, and a few were down all week. Pig iron sellers don't look for a full return to pre-Christmas levels much before the second week of January, and don't anticipate much real pressure for tonnage for sometime beyond that, as foundries don't expect any sharp improvement in demand for castings for a while.

Philadelphia—Pig iron shipments reflect yearend holiday influences. Foundries generally were closed down for the Christmas weekend and a number will be down over the New Year's weekend. A few closed down for the entire Christmas week.

Chicago—Prospects for gray iron jobbing foundries have brightened. Good business prospects in first half of 1953 are resulting in improved releases for castings, particularly from the household appliance industry. Pig iron supply has been in balance with demand recently but much increase in melting requirements could bring back a strained situation.

Los Angeles—Foundry activity is increasing. Pourings are 15 to 20 per cent higher than in last quarter. Melters, expecting 1953 volume to equal or better that in 1952, foresee no shortage of pig iron.

Scrap . . .

Scrap Prices, Page 114

Chicago—The scrap market seems destined to continue in the rut for some time. New buying lags and conditions don't change enough from week-to-week to provide color or good conversation. Steelmaking material moves in volume closely approximating consumption. Weather has provided little interference with collections, preparation or shipments so far this month. Mill inventories are in the neighborhood of 60 days. Cast scrap demand shows no improvement although foundry operations are up a little. This material is so abundant that it is insensitive to demand changes; prices are irregular, ranging to $5 or more below ceilings.

Philadelphia—Steel mill scrap prices continue at ceiling, reflecting a steady, if not particularly strong, demand. Cast scrap prices continue weak on the other hand, with several grades quoted below ceiling.

Pittsburgh—Scrap dealers and buyers are sitting out the end of the year. While not at a standstill the industry reports only isolated transactions. Major grades continue at ceiling prices. Cupola cast scrap is weak. Specialties are getting more attention.

Youngstown—Scrap is plentiful and some big consumers are reluctant to take additional tonnage. This is in decided contrast to a year ago when the mills were hard pressed to keep their open hearths in operation. All plants here have built up mountains of scrap. Republic Steel, Youngstown Sheet & Tube and Sharon Steel are reported to have shut off part of their inflow. However, some executives are fearful a new scarcity might develop in 1953, particularly if there is war. Scrap is going at ceiling prices.

Detroit—Industrial scrap is in strong demand here, stronger, most traders say, than anywhere else in the country. Dealer scrap is not as avidly sought, however. Foundry demand has dropped off although when material moves it quite often does so at the ceiling. The cast iron market as a whole is listless. Electric furnace operators in this district are buying all the suitable scrap they can lay their hands on and are no longer in the desperately short position one was recently.

St. Louis—Shipments are slow. Brokers' purchases are light. Dealers say yard receipts are off 25 to 50 per cent. Deliveries to mills are the lowest in months. Production interruptions, however, have enabled even the sparse shipments to build ground stocks of 45 to 60 days. Melters say quality is unusually good considering the limited collections. Dealers report the quiet market has one favorable facet: Open weather has permitted them to process and ship all metal in their yards, which leaves no capital tied up in idle tonnage. Cast is either not moving or being sold in truckloads. Dealers describe the cast market as dead.

Los Angeles—Steelmaking scrap is moving steadily and mill inventories are improving. Trade observers question if the price level will stand in face of continued improvement in mill inventories.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 111

Chicago—Foundry coke is available in abundant supply and consumer stocks are good. Output is somewhat below full capacity thus expansion in castings production will not pose any problem from a fuel angle.

Semifinished Steel . . .

Semifinished Prices, Page 107

Pittsburgh—Ingot operations took a slight drop during the holiday week. Some mills reported an operating rate equal to the previous week, but others declined as low as 79 per cent.

Los Angeles—Shortage of semifinished steel limiting finished product output of Kaiser Steel Corp.'s Fontana mill, is being eased by some customers who are supplying ingots for conversion.

Iron Ore . . .

Iron Ore Prices, Page 113

Cleveland—Stocks of iron ore at lower lake docks and furnaces on Dec. 1 totaled 51,207,577 tons, according to the Lake Superior Iron Ore Association. This was slightly more than on Dec. 1, 1951 when stocks amounted to 49,098,907 tons.

Consumption of lake ore declined in November. Use during the month amounted to 7,825,648 tons compared with 8,049,031 in October. In November, 1951, consumption totaled 7,624,172 tons.

Total consumption of iron ore in the first 11 months of 1952 was down substantially from that in the like period of 1951 due to the two-month steel strike during the summer. In the period use amounted to 70,049,876 tons compared with 81,730,283 tons in the corresponding period of last year.

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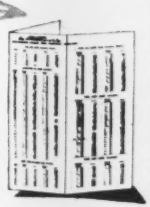

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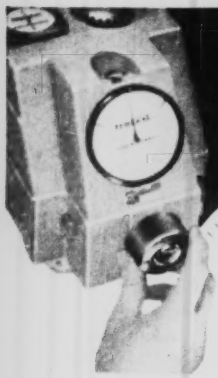

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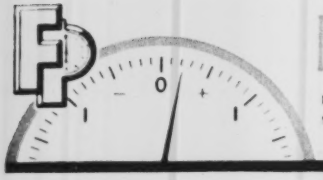

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Warehouse . . .

Warehouse Prices, Page 113

Washington—Steel distributors now are required to obtain certificates attesting compliance with NPA's regulation covering sales of nickel-bearing stainless steel and high nickel alloy. Under Schedule 5 to NPA Order M-6A, those purchasing high nickel alloys must furnish an end-use certificate to their distributors. Schedule 3 to M-6A, already in effect, requires certification to distributors by persons purchasing nickel-bearing stainless steel products.

NPA also amended Schedule A to Order M-80 requiring persons ordering nickel-bearing stainless steel or high nickel alloys from a melter, processor, or further converter furnish the supplier with a certification. Persons ordering the material must certify that it will not be used in violation of M-80, which controls ferroalloys and ferroalloy products.

Action by NPA was taken to implement instructions already issued to melters and processors of alloying materials. These instructions permit "basket" groups of orders on the melt sheets submitted to NPA showing their uses of such materials. By grouping items containing the same alloying materials on melt sheet reports, melters and processors, as well as NPA, will save a substantial amount of paperwork. The two measures replace, in part, amendment 4 to M-80 which is revoked.

Boston — Specialties are in better balance to meet demand than standard carbon warehouse products, structurals, shapes and bars. Larger sizes of the latter are more critical than smaller ranges, although structurals and sheared plates are difficult in all sizes. Pipe jobbers are building up better balanced inventories, but still take monthly allotments in most cases. Demand on warehouses for sheets the next two months will be heavy.

New York—Warehouses close the year with inventories on most major standard products depleted and unbalanced. Plate, shape, bar and carbon sheet stocks are hardly heavier than at start of the current quarter. Heavier gages in hot-rolled sheets are exhausted with many distributors. Merchant steel pipe is moving near quota levels, but nails are slow. Steel moved to warehouses this year will approximate 20 per cent of mill shipments, but the fact remains they will have taken in nearly 1.5 million tons less than in 1951.

Philadelphia — Warehouse business is limited by what the distributors can accumulate for sale. This is especially true of the major hot carbon lines, such as plates, shapes, bars and sheets. While some sellers closed down for the Christmas weekend, they are expected to operate on Friday following the New Year's holiday.

Pittsburgh — Warehouses expect strong business during first quarter. Their current problem is still one of balance in supply. Large diameter bars and heavy sheets are in big demand but poor supply. Tin mill products are plentiful.

Cleveland — Warehouse order volume will be cut over the holiday

HOW THE *SCRAP* THAT JACK MADE —MADE JACK *AND MORE*

This is the Scrap that Jack made.

This is the Man who found the Scrap that Jack made.

This is the Clerk who was called by the Man who found the Scrap that Jack made.

This is the Dealer who dealt with the Clerk who was called by the Man who found the Scrap that Jack made.

AND TO MAKE THE STORY SHORTER:

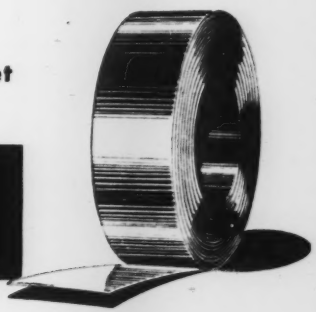
This is the jack the dealer paid for the Scrap that Jack made.

AND THIS IS THE STEEL THAT INDUSTRY GETS

from the Scrap that Jack made!

MORAL:

Check your Plant for Scrap Today and Get it Moving—*That* Pays Everybody!



Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

Week but distributors expect prompt resumption of active demand immediately after turn of the year. Their stocks have been improving right along for the past several months, warehouse inventories generally now being estimated at about 50 per cent of those held in October, 1949. Stocks, however, are highly unbalanced and not much improvement in this direction is expected until second quarter at earliest, especially in such acutely short supply items as large bars and heavy plates.

Los Angeles Warehouses have more steel to sell and demand is surprisingly strong. Distributors' inventories are approaching 60 per cent of normal. Warehouse activity is steady at the November level contrary to the usual seasonal decline.

Canada . . .

Ottawa, Ont. Effective Jan. 1, Canada's Department of Defense Production, under a new order SD-3 removes the limitation on steel inventories outlined in order SD-1. The new order revokes order SD-2, which restricts purchase of steel materials for certain types of building construction. End-use certification on purchase orders for steel materials will still be required and power to direct steel to defense contractors remains.

The new order SD-3 means that anyone desiring to build a theatre, bowling alley, tavern, certain types of plants, stores and similar structures, formerly prohibited, will be permitted to buy steel if it is available.

Inventory limitations also are rescinded. This has been a control affecting those eligible for steel permits. Whether an applicant got all, part or none of the steel he wanted was determined largely by what stock he had on hand.

The government retains only one control—that by which it insures that defense industries will get the steel they require.

Steel controls have been in effect since January 1, 1951.

The lifting of controls was announced in the House of Commons by John Dickey, parliamentary assistant to Defense Production Minister Howe. He said the prospect of improved supplies of steel justifies revoking the prohibition on non-essential building. However, he said that it will be necessary to exercise control over steel distribution to insure that defense requirements are met. In other words, if a plant making guns or other war materials needs steel, the Department of Defense Production will still be in position to direct a producer to supply it.

Mr. Dickey said although continued improvement in supply of steel can be expected, some products will be relatively hard to get for some time.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

900 tons, galvanized transmission towers, American Gas & Electric Co., Cincinnati.

4500 tons going to Lehigh Structural Steel Co., Allentown, Pa., and 4500 tons to Bethlehem Steel Co.

3300 tons, various buildings in Michigan for Union Carbide & Carbon Corp., New York, to Allied Structural Steel Co.

3200 tons, state thruway, Albany county, New York, to Phoenix Bridge Co., Phoenixville, Pa.

2000 tons, warehouses, Ford Motor Co., Teterboro, N. J., to Elizabeth Iron Works, Elizabeth, N. J.

1110 tons, building construction, International Business Machines Co., Poughkeepsie, N. Y., to White Plains Iron Works, White Plains, N. Y.

1000 tons, section, Market St. subway, Philadelphia, through the Kaufman Construction Co., Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, state highway bridge, Annapolis, Md., to American Bridge Co., Pittsburgh.

235 tons, building, General Electric Co., Glendale, N. Y., to Elizabeth Iron Works, Elizabeth, N. J.

205 tons, power house, Polson, Mont., to Kansas City Structural Steel Co., Kansas City, Kans.

RAILS, CARS . . .

LOCOMOTIVES PLACED

The Illinois Terminal, four 1500-hp diesel units, to the Electro-Motive Division, General Motors Corp., La Grange, Ill.

LOCOMOTIVES PENDING

Missouri-Illinois, two 1500-hp diesel units.

RAILROAD CARS PLACED

Missouri-Illinois, 100 seventy-ton hopper cars, to the Desoto, Mo., shops of the Missouri-Pacific, parent company.

St. Louis-San Francisco, 100 fifty-ton pulp wood cars to its own shops.

The Cleveland Steel Tool Co.
• PUNCHES • DIES • CHISELS • RIVET SETS •
IF IT'S RIVETED YOU KNOW IT'S SAFE
WE FEATURE SPECIAL PUNCHES & DIES
660 E. 82nd ST., CLEVELAND, O.

H&G Insert Chaser DIE HEADS
famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.
THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: A. C. Barbringer, 331 N. San Pedro St., Los Angeles, California. Canada: F. F. Barber Machinery Co., Toronto, Canada.

THE BELMONT IRON WORKS
STRUCTURAL STEEL—BUILDINGS & BRIDGES
RIVETED—ARC WELDED Cable Address—Beliron
Engineers—Fabricators—Erectors—Contractors—Exporters
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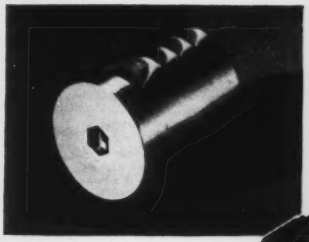
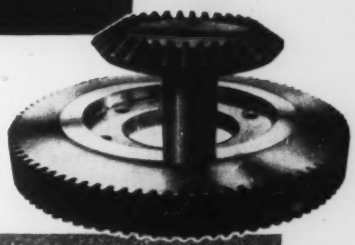
Main Office: Phila. 46, Pa.
New York Office—44 Whitehall St., N. Y. 4, N. Y.

To Lower your Overhead...
BROWNING ELECTRIC TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY
VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

IF METALWORKING PLANTS ARE YOUR PROSPECTS . . .
STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.





Tooling or Re-tooling?

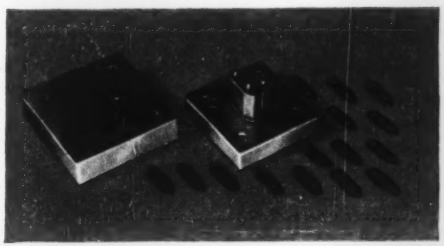
L&N FURNACES HELP TOOLS PRODUCE MORE

• Shown here are the tools and dies of some of the literally hundreds of firms that have found how to cut tool costs with Vapocarb-Hump Hardening and Homo Tempering Furnaces.

Butcher & Hart Co., Toledo, for instance, gets the uniform heating it needs to avoid distortion of the recessed head of cold-heading dies like the one shown.

The special gears of Sonoco Products Co., Hartsville, S.C., are heated with the uniformity needed to preserve their firm, true-running fit.

Towle silverware dies leave the Homocarb furnace with never a particle of scale in their intricately carved detail—need none of the stoning and other time-consuming hand finishing that would be required if scale had developed.



Heat-Treating Costs Least, Adds Most to Tool Life

A cost analysis of the simple punch and die set shown above gives a picture of the relative costs of tool-making and of heat-treating, in producing a complete tool.

The toolmakers who shaped and assembled the punch and die used machine tools worth $31,000, beginning with the cutting off of the steel and ending with the final filing. And, the tool-making time was 21 man-hours.

The heat-treater, on the other hand, used Vapocarb-Hump Hardening and Homo Tool Tempering equipment costing, complete with controls, only $5,500; and he did both jobs in 3 hours.

In other words, heat-treating represents only one-sixth of the total tool cost, yet it is largely responsible for the future performance of the tools. This is a typical example of the familiar fact that it pays to give the heat-treater precision equipment in both furnaces and controls. Whether you're tooling or re-tooling, the heat-treat's comparatively small cost can make a big difference in tool life.

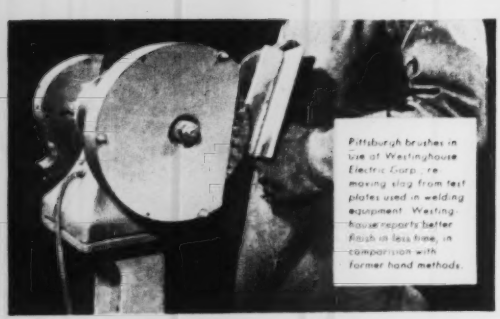
A letter or call to our nearest office, or to 4957 Stenton Ave., Phila. 44, Penna., will bring complete catalog information or put you in touch with an experienced heat-treat engineer, as you wish.

CAREER OPPORTUNITIES AT L&N

Expansion program of this long-established firm has many features to attract outstanding recent graduates in engineering and science. Opportunities are in sales field engineering, product and application engineering, research, advertising, market development. Widely-respected policies assure recognition of progress and achievement. Address Personnel Manager for preliminary interview at nearest of 17 L&N offices.

LEEDS NORTHRUP

INSTRUMENTS AUTOMATIC CONTROLS • FURNACES


Pittsburgh brushes in use at Westinghouse Electric Corp., removing slag from test plates used in welding equipment. Westinghouse reports better finish in less time, in comparison with former hand methods.

Replace hand finishing with power-driven Pittsburgh Brushes for

Better Cleaning
Lower Labor Costs
Fewer Rejects

—as these companies did:

Removal of imbedded slag in welding test plates formerly was done by hand at the Westinghouse Electric Corp., Trafford, Pa., using a wire brush and welder's hammer. Pittsburgh brushes, powered by a direct-drive ½ h.p. motor, now remove more slag in less time, and produce a better finish. In addition, Westinghouse reports their Pittsburgh brushes "stand up better than average in use."

Complete cleaning of dried concrete, rust and scale from steel frames used in concrete forming is essential prior to re-using the forms. Pittsburgh wire brushes were installed at the Universal Form Clamp Co., Chicago. Working on a conveyor fed machine, the Pittsburgh brushes now remove all foreign material at a rate of 50 pieces per hour, replacing former laborious hand brushing and scraping.

De-scaling preheated bar stock at the Dominion Forge & Stamping Co., Ltd., Canada, was formerly done by hand scraping. This never did a complete job, and inclusions resulted which produced defective forgings. Pittsburgh brushes, on specially-designed machines, now do the job, and have "increased efficiency, decreased the amount of scrap, improved work quality, and saved labor."

WRITE TODAY FOR FREE BOOKLET!

Write today for a free copy of our booklet that shows, through actual case histories, how Pittsburgh cuts brushing costs. Address: PITTSBURGH PLATE GLASS COMPANY, *Brush Div.*, Dept. W-11, 3221 Frederick Avenue, Baltimore 29, Maryland.

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Power Driven

BRUSHES

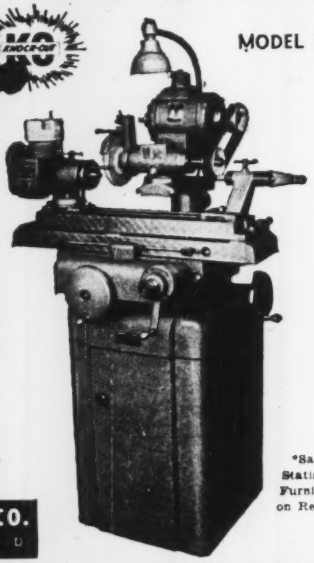
BRUSHES • PAINTS • GLASS • CHEMICALS • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

There's a reason 71%*

of all popularly-priced Tool and Cutter Grinders sold in 1951 were "*Knock-Outs*"

MODEL B860



Will do anything that machines costing 2 or 3 times more will do . . . yes and in less time.

Distributed Only Through Franchise Dealers

K. O. LEE CO.
ABERDEEN, S. D.

*Sales Statistics Furnished on Request

HIGH SILICON IRON

"JISCO"

SILVERY PIG IRON

A Blast Furnace Product made from only Virgin Ores

THE JACKSON IRON & STEEL CO. · JACKSON, OHIO

OHIO LOCOMOTIVE CRANES

25 TO 50 TON CAPACITY

DIESEL · GASOLINE · ELECTRIC · STEAM

THE OHIO LOCOMOTIVE CRANE CO
BUCYRUS, OHIO

PERFORATED METALS
FOR ALL INDUSTRIAL USES

PERFORATIONS IN LIGHT SHEETS
TO HEAVY PLATES
ARCHITECTURAL GRILLES
SEND FOR CATALOG NO. 35

DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Davis Heads Conveyor Association

Harry C. Davis, general manager, Kanawha Mfg. Co., Charleston, W. Va., was elected president of Conveyor Equipment Manufacturers Association, Washington, succeeding G. Walter Ostrand, general manager, Caldwell plant, Link-Belt Co., Chicago. R. C. Sollenberger, for many years the staff head of the organization, was re-elected executive vice president. Other officers are: R. F. Tomlinson, general sales manager, Oliver Corp., A. B. Farquhar Division, York, Pa., vice president; Jervis C. Webb, executive vice president and general manager, Jervis B. Webb Co., Detroit, treasurer; Fred S. Wells, vice president, Stephens-Adamson Mfg. Co., Aurora, Ill., secretary.

West Coast To Get Battery Plant

Delco-Remy Division, General Motors Corp., Anderson, Ind., will construct an automobile storage battery plant in Anaheim, Calif. Construction will begin as soon as National Production Authority approves the project.

Nesco Moves Two Departments

Offices of the sales and advertising departments of Nesco Inc., housewares manufacturer, were moved from Chicago to 947 W. St. Paul Ave., Milwaukee. They will be combined with the firm's accounting, purchasing and engineering departments at the Milwaukee address.

Cleco Appoints Distributors

Cleco Division, Reed Roller Bit Co., Houston, appointed Grant & Co., Los Angeles; H. N. Crowder Jr., Allentown, Pa.; and Ponsford Equipment Co., El Paso, Tex., as distributors for Cleco air tools and accessories.

Permutit Co. Continues To Expand

Coincident with completion of Permutit Co.'s 1952 program for doubling capacity of its Birmingham, N. J., Works for the production of ion exchange resins, the company placed contracts for further extensions and improvements, including a laboratory and pilot plant building to cost about $200,000.

Tungsten Carbide Refinery Opened

Opening of Canada's first refinery for the production of pure tungsten carbide directly from tungsten ores is reported by Philip M. McKenna, president, Kennametal Inc., Latrobe, Pa. The new works, known as Macro Division of Kennametal Inc., are located at Port Coquitlam, B. C. Both domestic and foreign ores are refined by the McKenna processes on which Kennametal has been granted Canadian and United States patents. In addition to tungsten carbide, the refinery will produce pure titanium carbide, the basis for a series of titanium carbide alloys for heat-resistant applications.

Gabriel To Reopen Iron Works

Gabriel Rolled Steel Products Co., Detroit, will establish operations in the former West Pittston Iron Works plant in West Pittston, Pa. The plant has been idle for several years. In 1942 it was engaged in the production of steel plates for Army tanks.

Beckman To Build $2 Million Plant

Beckman Instruments Inc., South Pasadena, Calif., plans to build a $2 million plant at La Habra, Calif. The company applied for a permit to erect an office building, a manufacturing and assembly plant, and a warehouse and shop. It proposes to build a fourth building later.

Tebben To Survey Plating Markets

John D. Tebben & Co., Birmingham, Mich., management consulting firm, will make a complete survey of the markets for the various products manufactured and distributed by Wagner Bros. Inc., Detroit, manufacturer of plating supplies and equipment. Expansion and alteration of Wagner's present distribution and warehousing facilities and methods are now in process.

Metal Finish Inc. Organized

Metal Finish Inc., Newark, N. J., was organized as a barrel finishing firm. The company specializes in tumbling equipment, supplies and services. Paul E. Kirchartz is president.

Metal Fabricator To Expand Plant

Quaid Fabrications Inc., specializing in alloy metal fabrication, was organized by James A. Quaid, president. The firm acquired the complete manufacturing facilities and business of Fabricated Metals Co., 157-167 W. Oxford St., Philadelphia. The company has placed contracts for additional equipment required to expand production. The three op-

STANDARD AND SPECIAL WASHERS
AND SMALL STAMPINGS
SPECIAL WASHERS to your specifications. Any size . . . any metal . . . any quantity. More than 30 years of specialized experience in designing and manufacturing Special Washers . . . more than 12,000 sets of tools at your disposal.
SMALL STAMPINGS in any metal . . . any quantity. Hundreds of satisfied customers are testimony to our high quality and reasonable prices. Send us your specifications or prints.
THE MASTER PRODUCTS CO.
6400 Park Avenue
Cleveland 5, Ohio

erating divisions are: Fabrication Division, custom fabrication of alloy sheet metal equipment; Small Assemblies Division, production of small metal components principally for electronic manufacturers; Heat Exchange Equipment Division.

Denison Opens Branch Office

Denison Engineering Co., Columbus, O., manufacturer of oil hydraulic equipment, opened a branch sales and service office at 1200 Bissonnet, Houston. Denison Neale is the branch manager.

Baltimore Aircoil Sells Fan Division

Baltimore Aircoil Co. Inc., Baltimore, manufacturer of condensers and cooling towers, sold its Fan Division, the Baltimore Fan Co., to Universal Industrial Propeller Co., Stamford, Conn.

Plan $20 Million Jet Flight Project

Lockheed Aircraft Corp., Burbank, Calif., completed its master plan for a multimillion dollar jet flight center to be built at Palmdale, Calif. Final approval of the plant, which calls for expenditure of about $20 million during the next 18 months, is expected

NEW and REBUILT
MOTORS
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1 to 1500 H. P.
ELECTRIC EQUIPMENT CO.
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OPEN TIME
300 TON PRESS BRAKE
Will bend 20' x ¼" to 6' x ¾" Pl.
ST. JOSEPH STRUCTURAL STEEL CO.
Box 68 Sta. "A" St. Joseph, Mo.

We Sell!
STAINLESS STEEL
PLATE
SHEET
ROD
PIPE
TUBES
BAR
One of the LARGEST STOCKS in the East. Immediate Delivery—Warehouse Stock. One pound to a Carload. Submit your inquiry.
JANDRU Steel Corp.
MILL DISTRIBUTORS
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CIMCO SELECT MACHINE TOOLS GUARANTEED

Niles 36-44 Vertical Boring Mill.
King 42" Vertical Boring Mill, 2 heads.
Niles 42"-50" Driving Box Borer, Burnisher and Facer, late type.
Brown & Sharpe #3 Vertical Miller.
Cincinnati #3 Hi-Power Vertical Miller.
Hall Planetary Style D Miller.
Gould & Eberhardt 96 H Hobber.
Heald #50 Internal Grinder.
Landis 10x18 Plain Grinder, late type.
Sellers 4T Tool Grinder, motor drive.
Sellers 6T Tool Grinder, late type.
Landis 16 x 72 Plain Cylindrical Grinder.
Brown & Sharpe #12 Plain Grinder, reversing mechanism.
Heald #70A Internal Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Heald 42 Borematic.
Jones & Lamson 8 x 31 Thread Grinder.
Heald 72-A3 Plain Internal Grinder.
Lodge & Shipley 16" x 6' single pulley drive, 12 spindle speeds.
American 16" x 8', 3 SCD, 56" center distance, 1¼" hole in spindle.
Blount Model B-3 Special Application Lathe for Turning, 20" swing, 2⅞" hole in spindle, 54" centers.
Lodge & Shipley 20 x 8, single pulley drive, 12 spindle speeds.
Bradford 20" x 18', 4 SCD, 12' center distance, Loose change.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
Fellows 725 Gear Shaper with Spur Guide.
Fellows 612 Spur Gear Shaper.
Brown & Sharpe 3-26 Gear Cutter.
Oliver Template Tool Bit Grinder.
Lodge & Shipley 16" x 126" centers G.H. Lathe, Timken bearing, complete with taper attachment, late type.
Niles 4'6" x 4'6" x 16' Double Housing Planer, 4 heads, box table, DC reversible drive.
Landis 26" x 168" Plain Cylindrical Grinder.
American 30" x 14' G.H. Lathe, 12 speed.
Monarch 24" x 12' G.H. Lathe, complete with 22" 4 jaw chuck and taper attachment.
American 36" x 40" Lathe, Internal Face Plate Drive, with 4" raising blocks, 33" center distance.
Bliss #55 Drawing Press, 5" stroke.
Pond 84 x 84 x 16' Double Housing Planer, DC motor drive, 4 heads.
Cincinnati #2 Centerless Grinder.
Cincinnati-Bickford 4'11" column Radial drill, gear box on base.
Cincinnati-Bickford 3½' Radial Drill.
Cincinnati-Bickford 4'11" Radial Drill.
Hartbett No. 600-36" UK Traveling Wheel Face Grinder, new 1946, table 72" x 36" long, 100 HP grinding wheel motor.
Baker #217 Upright Drill Press.
Gisholt 11, Saddle Type Turret Lathe, with bar feed, late type.

GUARANTEED MACHINERY
Cincinnati Machinery Company Incorporated
207 E SECOND STREET
CINCINNATI 2, OHIO

FOR SALE
IMMEDIATE DELIVERY—WAREHOUSE STOCK

HOT ROLLED ROUNDS

1	1 8 Dia.	2400 lbs
2	3 16 Dia.	224 lbs
3	1 4 Dia.	240 lbs
4	5 16 Dia.	105 lbs
5	3 8 Dia.	121 lbs
6	1 2 Dia.	142 lbs
7	3 4 Dia.	22 lbs
8	13 16 Dia.	12 lbs
9	15 16 Dia.	72 lbs
10	1 1 16 Dia.	88 lbs
11	1 3 16 Dia.	525 lbs
12	1 1 4 Dia.	283 lbs
13	1 3 8 Dia.	2761 lbs
14	1 7 16 Dia.	76 lbs
15	1 9 16 Dia.	1168 lbs
16	2 Dia.	440 lbs
17	2 1 8 Dia.	73 lbs
18	2 1 4 Dia.	164 lbs
19	2 7 16 Dia.	1663 lbs
20	2 1 2 Dia.	5669 lbs
21	2 3 4 Dia.	126 lbs

HOT ROLLED FLATS

1	3 8 x1 1 8	48 lbs
2	3 8 x6	111 lbs
3	1 2 x6	116 lbs
4	1 2 x1 1 2	90 lbs
5	1 2 x1	666 lbs
6	1 2 x5	645 lbs
7	1 2 x1 1 4	310 lbs
8	5 8 x4	134 lbs
9	5 8 x5	169 lbs
10	3 4 x1 1 4	146 lbs
11	3 4 x2	1105 lbs
12	3 4 x2 1 4	481 lbs
13	3 4 x2 3 4	1031 lbs
14	3 4 x1	105 lbs
15	3 4 x2 1 2	597 lbs
16	1 x2	241 lbs
17	2 1 4 x2 1 2	255 lbs
18	2 1 4 x2 3 4	343 lbs
19	2 1 4 x4	160 lbs
20	2 1 2 x4 1 16	578 lbs

HOT ROLLED SQUARES

1	5 8 x5 8	203 lbs
2	7 8 x 7 8	415 lbs
3	1 1 8 x 1 1 8	450 lbs
4	1 1 4 x 1 1 4	58 lbs
5	1 3 8 x 1 3 8	71 lbs
6	1 3 4 x 1 3 4	60 lbs
7	2 x 2	240 lbs
8	2 1 4 x 2 1 4	277 lbs
9	2 1 2 x 2 1 2	172 lbs
10	3 x 3	394 lbs
11	3 9 16 x 3 9 16	191 lbs

HOT ROLLED HEX

1	5 8	25 lbs
2	7 8	30 lbs
3	1 1 2	810 lbs
4	1 5 8	129 lbs
5	1 3 4	46 lbs
6	1 13 16	2161 lbs
7	2 9 16	4764 lbs

ROUND BARS—HIGH CARBON

1	1 7 16	6.125 lbs
2	1 13 16	100.151 lbs
3	1 15 16	118.486 lbs
4	8 5 8	9.578 lbs

ROUND BARS—SAE 1095

1	2 1 16 Dia.	10.750 lbs
2	2 3 8 Dia.	7.006 lbs
3	2 13 16 Dia.	5.175 lbs
4	2 7 8 Dia.	14.329 lbs

ROUND BARS—ALLOY

1	1 Dia.—Aircraft	3.000 lbs
2	2 5 16 Dia.	8.742 lbs

JANDRU STEEL CORPORATION
131 Bruckner Boulevard New York 54, New York
Telephone: CYpress 2-5617

CLASSIFIED RATES

All classifications other than "Positions Wanted," set solid, minimum 50 words, $12.50, each additional word .25; all capitals, minimum 50 words $18.00, each additional word .32; all capitals leaded, minimum 50 words $19.50, each additional word .39. "Positions Wanted" set solid, minimum 25 words, $3.00, each additional word .12; all capitals, minimum 25 words $3.75, each additional word .15; all capitals, leaded, minimum 25 words $4.50, each additional word .18. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. These rates are subject to 15 per cent agency commission and 2 per cent cash discount ten days. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Bldg., Cleveland 13, Ohio.

RAILROAD EQUIPMENT—*FOR SALE*

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Double Sheathed, 50-Ton Capacity
Box, Single Sheathed, 50-Ton
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled
Gondolas, Composite, or All Steel 50-Ton and 70-Ton
Hoppers, Covered, All-Steel, 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, *Cross Dump*

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

CABOOSE CARS

Eight Wheel, Cupola Type

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door
End Dump, 20-Yd., 50-Ton Drop Door
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10 ga.	36" x 96"	74 Sheets	Type 304
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9 ga.	48" x 120"	2 Sheets	Type 321
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1/4"	36" x 96"	55 Plates	Type 321
3/8"	36" x 96"	2 Plates	Type 321
3/8"	36" x 120"	2 Plates	Type 321
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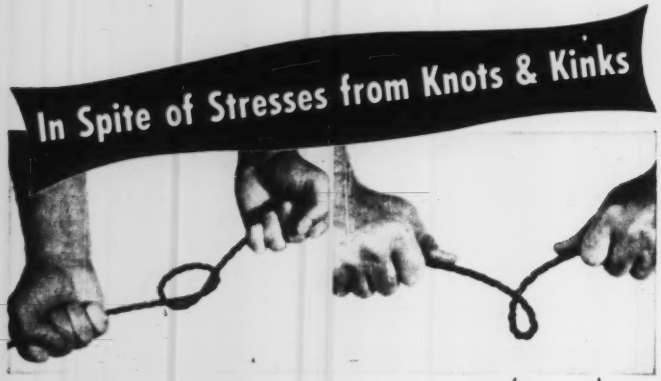

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Room to Stretch Here

A steelman finds room to study charts within this large blast furnace bell cast at the Bethlehem, Pa., plant of Bethlehem Steel Co. The steel bell weighs 26 tons and has outside diameter of over 16 feet. At this point in its manufacture, the bell has been rough machined on the outside and eight balancing blocks are welded inside

shortly from the Air Force. Construction work is scheduled to begin soon after the first of the year. Manufacturing and flight test facilities at Palmdale would be shared by Lockheed, North American Aviation Inc. and Northrup Aircraft Inc.

Allied Research Products Expanding

Allied Research Products Inc., Baltimore, is erecting a maintenance shop to the rear of its plant. The company's main product is a patented chemical for zinc, cadmium, aluminum, brass and copper plating.

Virco Mfg. Erecting Addition

Virco Mfg. Corp., Los Angeles, is constructing an addition to its plant at 15134 So. Vermont Ave., Los Angeles. The firm makes classroom furniture, folding chairs and tables.

Westinghouse To Build in Alabama

Westinghouse Electric Corp., Pittsburgh, will start work in February on the South's first plant for production of welding electrodes and brazing alloys. The plant, to be built near Montevallo, Ala., 38 miles south of Birmingham, will represent an initial expenditure of more than $3 million. Richard A. Ballentine of Westinghouse Electric's Buffalo operations has been named plant manager. This is the third facility announced for

Planes Await Completion

Lined up in military order, fuselages and wings of R7V-1 Super Constellations await completion at Lockheed Aircraft Corp.'s Burbank, Calif., factory. On order from the Navy, the airplanes wait to be fitted with new 3250-horsepower Wright Turbo-Compound engines. Innerwing sections move on elevated tracks at front, while fuselages progress from rear line-up to the final assembly line

Alabama by the corporation in the last two years.

Allis-Chalmers Establishes Branch

A branch of the Cleveland district office of Allis-Chalmers Mfg. Co.'s General Machinery Division was established in the First National Tower, Akron, O. This branch is under the management of Fred C. Timberman.

Air Conditioning Firm Names Agents

United States Air Conditioning Corp., Minneapolis, appointed Treaty Co., Greenville, O., and Hesco Corp., Cincinnati, as distributors for its packaged air conditioning equipment.

Loveman Building Warehouse

D. Loveman & Son Export Corp., Cleveland, distributor of steel sheets and plates, is building a warehouse on Perkins road at Aurora road, Bedford Heights, O.

Bacon Industries Inc. Organized

Frederick S. Bacon and Philip D. Wilkinson, partners in Frederick S. Bacon Labortories, Watertown, Mass., organized Bacon Industries Inc. to produce O-rings, gaskets and similar specialty products formerly manufactured by Frederick S. Bacon Laboratories.

Well rounded figures

to help keep your production rolling! . . .

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Representing a quarter of a million square feet of highly flexible metal-working facilities . . . mass producing varied jobs for government and industrial manufacturers. You get on-the-dot deliveries and skilled, experienced precision workmanship to exacting qualifications.

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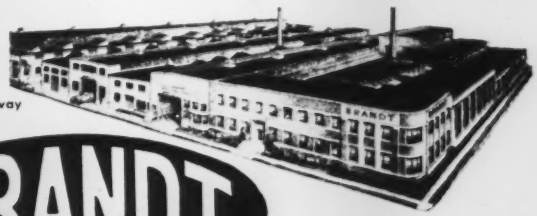

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Controlled Atmosphere

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PARTS MADE OF STAINLESS can be

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With our special S. & W. alloy for bright-brazing stainless, the color matches the metal, resists dulling, and the joint is practically invisible. Gold and silver parts are soldered in the same continuous-production furnace with equal success.

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Every small unit is built to precision standards—as outstanding in quality and performance as larger Clevelands. Illustrated above are the 10 AT (left) and 00 D (right) speed reducers, both 3-inch centers.

Enjoy the benefits of worm gear drives in smaller CLEVELAND speed reducers

WHEN you want a quiet, powerful, dependable drive for a small machine, choose a Cleveland Worm Gear Speed Reducer.

As built by Cleveland, the worm gear reducer is a drive of many advantages:

1. It is compact and inherently quiet, transmitting power with smooth, uninterrupted torque flow.
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3. It has a minimum of moving parts.
4. Shock load resistance and other factors of safety are high.
5. Rate of wear of case hardened steel worm on nickel-bronze gear is very low, insuring long life.

Write for Bulletin 114F which illustrates and gives engineering data on smaller size Clevelands—many now available for immediate delivery. The Cleveland Worm and Gear Company, 3270 E. 80th St., Cleveland 4, O.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND

Speed Reducers

Choice of the Leaders

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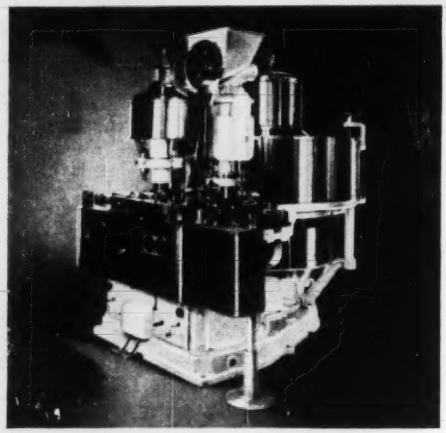
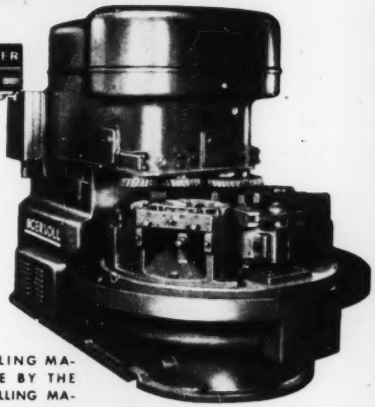
MOTOR CONTROL
C-H

The Mark of Better Machines

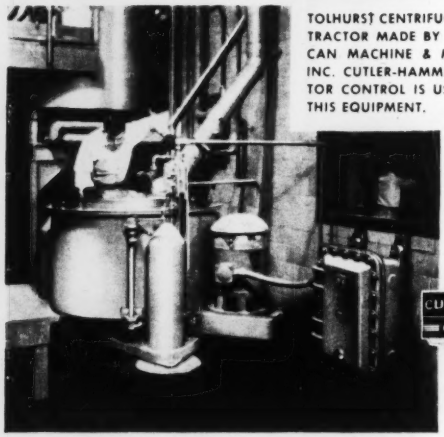


CEM 20 DELUXE SYRUPER-FILLER-CROWNER MADE BY CROWN CORK & SEAL CO. EQUIPPED WITH CUTLER-HAMMER CONTROLS.

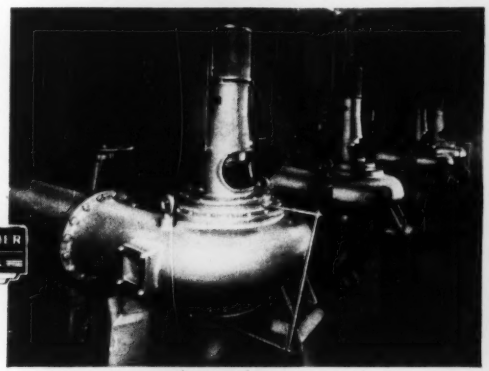


ROTARY MILLING MACHINE MADE BY THE INGERSOLL MILLING MACHINE COMPANY. 100% CUTLER-HAMMER MOTOR CONTROL.

YEOMANS VERTICAL SEWAGE PUMPS MADE BY YEOMANS BROTHERS COMPANY. CUTLER-HAMMER MOTOR CONTROL IS SUPPLIED AS STANDARD EQUIPMENT WITH YEOMANS PUMPS.



TOLHURST CENTRIFUGAL EXTRACTOR MADE BY AMERICAN MACHINE & METALS, INC. CUTLER-HAMMER MOTOR CONTROL IS USED ON THIS EQUIPMENT.



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